

July 10, 2002

Ms. Joan Kessner Bechtel Hanford Inc. 3350 George Washington Way Richland, WA 99352 MSIN: H0-25

Reference:

P.O. #630

Eberline Services R2-05-121-7284, SDG H1788

Dear Ms. Kessner:

Enclosed is the data report one solid sample designated under SAF No. B02-050 received at Eberline Services on May 22, 2002. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion

Meliso Mam

Program Manager

MCM

Enclosure: Data Package

450562821297510 450562821297510

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

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1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1788 was composed of one solid (soil) sample designated under SAF No. B02-050 with a Project Designation of: 216-Z-11 Ditch Borehole Samples. The sample in SDG H1788 (Group 7284) was batched with the sample in SDG H1779 (Group 7278).

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

The matrix spike was associated with SDG H1779 (Group 7278). The matrix spike percent recovery was 90%. No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-239 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

The LCS had a yield of 106% slightly above the laboratory protocol limits (20 to 105%). No other problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.8 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.9 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

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Transplutonic Analyses (Am-241 and Cm-243/244) 2.10

No problems were encountered during the course of the analyses.

2.11 **Gamma Spectroscopy Analyses**

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Mello Marm Melissa C. Mannion

7/10/02

Program Manager

SDG 7284 Contact Melissa C. Mannion

Client Hanford Contract No. 630 Case no SDG H1788

SUMMARY DATA SECTION

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Melene Manne Prepared by Melen Manne

Reviewed by

SAMPLE DELIVERY GROUP H1788

SDG <u>7284</u>

Contact Melissa C. Mannion

REPORT GUIDE

Client	Hani	ford	
Contract	No.	630	
Case no	SDG	H1788	

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG. $\,$

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

REPORT GUIDES
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SAMPLE DELIVERY GROUP H1788

SDG <u>7284</u>

Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H1788

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

REPORT GUIDES

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SAMPLE DELIVERY GROUP H1788

SDG 7284
Contact Melissa C. Mannion

SAMPLE SUMMARY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H1788</u>

CLIENT SAMPLE ID	LOCATION	MATRIX ĹEVEI	LAB L SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B14KC7	200 W	SOLID	R205121-01	B02-050	B02-050-27	05/17/02 11:05
Method Blank		SOLID	R205097-03	B02-050		
Lab Control Sample		SOLID	R205097-02	B02-050		
Duplicate (R205121-01)	200 W	SOLID	R205121-02	B02-050		05/17/02 11:05

SAMPLE SUMMARY

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SUMMARY DATA SECTION

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SDG <u>7284</u> Contact <u>Melissa C. Mannion</u>

QC SUMMARY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H1788</u>

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SI			DEPARTMENT SAMPLE ID
7278		Method Blank Lab Control Sample	SOLID SOLID						R205097-03 R205097-02	7278-003 7278-002
7284	в02-050-27	B14KC7	SOLID	92.0	1745 g		05/22/02	5	R205121-01	7284-001
		Duplicate (R205121-01)	SOLID	92.0	1745 g		05/22/02	5	R205121-02	7284-002

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SAMPLE DELIVERY GROUP H1788

SDG 7284
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H1788</u>

			PREPARATION	ERROR			- PLA	NCHETS	ANALYZ	ED —	QUALI-
TEST	MATRIX	METHOD	BATCH	2σ %	CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG MS/ORIG	FIERS
Alpha	Spectros	сору									
NP	SOLID	Neptunium in Soil	7036-049	5.0	1			1	1	1/1	
PU	SOLID	Plutonium, Isotopic in Solids	7036-049	5.0	1			1	1	1/1	
TH	SOLID	Thorium, Isotopic in Soil	7036-049	5.0	1			1	1	1/1	
TP	SOLID	Americium 241/Curium in Solids	7036-049	5.0	1			1	1	1/1	
U	SOLID	Uranium, Isotopic in Soil	7036-049	5.0	1			1	1	1/1	
Beta	Counting										
SR	SOLID	Total Strontium in Soil	7036-049	10.0	1			1	1	1/1	
TC	SOLID	Technetium 99 in Soil	7036-049	10.0	1	,		1	1	1/1	
Gamma	Spectros	scopy									
GAM	SOLID	Gamma Scan	7036-049	15.0	1			1	1	1/1	
Liqui	d Scintil	lation Counting									
С	SOLID	Carbon 14 in Soil	7036-049	10.0	1			1	1	1/1	
H	SOLID	Tritium in Soil	7036-049	10.0	11			11	1	1/1	
NI_L	SOLID	Nickel 63 in Soil	7036-049	10.0	1			1	1	1/1	

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group. Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

PREP BATCH SUMMARY
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SDG 7284
Contact Melissa C. Mannion

WORK SUMMARY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H1788</u>

CLIENT SAMPLE LOCATION		MATRIX	LAB SAMPLE ID COLLECTED			SUF-				
CUSTODY	SAF No	garangan andreasan andreasan andreasan andreasan andreasan andreasan andreasan andreasan andreasan and a decid	RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	ВҮ	METHOD
B14KC7			R205121-01	7284-001	С		06/29/02	07/10/02	MCM	Carbon 14 in Soil
200 W		SOLID	05/17/02	7284-001	GAM		07/02/02	07/10/02	MCM	Gamma Scan
B02-050-27	B02-050		05/22/02	7284-001	Н		07/02/02	07/10/02	MCM	Tritium in Soil
				7284-001	NI_L		07/03/02	07/10/02	MCM	Nickel 63 in Soil
				7284-001	NP		07/10/02	07/10/02	MCM	Neptunium in Soil
				7284-001	PU		07/05/02	07/10/02	MCM	Plutonium, Isotopic in Solids
				7284-001	SR		07/05/02	07/10/02	MCM	Total Strontium in Soil
				7284-001	TC		07/02/02	07/10/02	MCM	Technetium 99 in Soil
				7284-001	TH		07/09/02	07/10/02	MCM	Thorium, Isotopic in Soil
				7284-001	TP		07/05/02	07/10/02	MCM	Americium 241/Curium in Solids
				7284-001	U		07/05/02	07/10/02	MCM	Uranium, Isotopic in Soil
Method Blank			R205097-03	7278-003	С		06/28/02	07/10/02	MCM	Carbon 14 in Soil
		SOLID		7278-003	GAM		07/02/02	07/10/02	MCM	Gamma Scan
	B02-050			7278-003	Н		07/02/02	07/10/02	MCM	Tritium in Soil
				7278-003	NI_L		07/03/02	07/10/02	MCM	Nickel 63 in Soil
				7278-003	NP		07/10/02	07/10/02	MCM	Neptunium in Soil
				7278-003	PU		07/05/02	07/10/02	MCM	Plutonium, Isotopic in Solids
				7278-003	SR		07/05/02	07/10/02	MCM	Total Strontium in Soil
				7278-003	TC		07/01/02	07/10/02	MCM	Technetium 99 in Soil
				7278-003	TH		07/09/02	07/10/02	MCM	Thorium, Isotopic in Soil
				7278-003	TP		07/05/02	07/10/02	MCM	Americium 241/Curium in Solids
				7278-003	U		07/05/02	07/10/02	MCM	Uranium, Isotopic in Soil
Lab Control Sa	ample		R205097-02	7278-002	С		06/29/02	07/10/02	MCM	Carbon 14 in Soil
		SOLID		7278-002	GAM		07/02/02	07/10/02	MCM	Gamma Scan
	B02-050			7278-002	Н		07/01/02	07/10/02	MCM	Tritium in Soil
				7278-002	NI_L		07/03/02	07/10/02	MCM	Nickel 63 in Soil
				7278-002	NP		07/10/02	07/10/02	MCM	Neptunium in Soil
				7278-002	PU		07/05/02	07/10/02	MCM	Plutonium, Isotopic in Solids
				7278-002	SR		07/05/02	07/10/02	MCM	Total Strontium in Soil
				7278-002	TC		07/02/02	07/10/02	MCM	Technetium 99 in Soil
				7278-002	TH		07/09/02	07/10/02	MCM	Thorium, Isotopic in Soil
				7278-002	TP		07/05/02	07/10/02	MCM	Americium 241/Curium in Solids
				7278-002	U			07/10/02		Uranium, Isotopic in Soil

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-CWS</u>

Version <u>3.06</u>

Report date <u>07/10/02</u>

SAMPLE DELIVERY GROUP H1788

SDG 7284
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client <u>Hanford</u>
Contract <u>No. 630</u>
Case no <u>SDG H1788</u>

CLIENT SAMPL	E ID	MATRIX	LAB SAMPLE II			SUF-				
CUSTODY	SAF No		RECEIVED	PLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD
Duplicate (R	205121-01)		R205121-02	7284-002	С		06/29/02	07/10/02	MCM	Carbon 14 in Soil
200 W		SOLID	05/17/02	7284-002	GAM		07/03/02	07/10/02	MCM	Gamma Scan
	B02-050		05/22/02	7284-002	Н		07/02/02	07/10/02	MCM	Tritium in Soil
				7284-002	NI_L		07/04/02	07/10/02	MCM	Nickel 63 in Soil
				7284-002	NP		07/10/02	07/10/02	MCM	Neptunium in Soil
				7284-002	PU		07/05/02	07/10/02	MCM	Plutonium, Isotopic in Solids
				7284-002	SR		07/05/02	07/10/02	MCM	Total Strontium in Soil
				7284-002	TC		07/02/02	07/10/02	MCM	Technetium 99 in Soil
				7284-002	TH		07/09/02	07/10/02	MCM	Thorium, Isotopic in Soil
				7284-002	TP		07/05/02	07/10/02	MCM	Americium 241/Curium in Solids
				7284-002	U		07/05/02	07/10/02	MCM	Uranium, Isotopic in Soil

TEST	SAF No	COUNTS OF	TESTS BY SAN	APLE TYPE CLIENT MORE	RE BLANK	LCS	DUP SPIKE	TOTAL
	B03 0E0	Carles 4/ in Cail	C1/ COV LCC	4		4	4	Τ ,
C	B02-050	Carbon 14 in Soil	C14_COX_LSC	1	!	1	-	4
GAM	B02-050	Gamma Scan	GAMMA_GS	1	1	1	1	4
Н	B02-050	Tritium in Soil	906.0_H3_LSC	1	1	1	1	4
NI_L	B02-050	Nickel 63 in Soil	NI63_LSC	1	1	1	1	4
NP	B02-050	Neptunium in Soil	NP237_LLE_PLATE_AEA	1	1	1	1	44
PU	B02-050	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1	1	1	1	4
SR	B02-050	Total Strontium in Soil	SRTOT_SEP_PRECIP_GPC	1	1	1	1	4
TC	B02-050	Technetium 99 in Soil	TC99_TR_SEP_LSC	1	1	1	1	4
TH	B02-050	Thorium, Isotopic in Soil	THISO_IE_PLATE_AEA	1	1	1	1	4
TP	B02-050	Americium 241/Curium in Solids	AMCMISO_IE_PLATE_AEA	1	1	1	1	4
U	B02-050	Uranium, Isotopic in Soil	UISO_PLATE_AEA	1	1	1	1	4
TOTALS				11	11	11	11	44

WORK SUMMARY
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R205097-03

METHOD BLANK

Method Blank

SDG <u>7284</u> Contact <u>Melissa</u>	C. Mannion Client/Case no Contrac	Hanford No. 630	SDG_H1788
Lab sample id <u>R205097-</u> Dept sample id <u>7278-003</u>	Material/Matri		SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	0.024	0.12	0.21	400	U	Н
Carbon 14	14762-75-5	1.31	2.8	4.7	50	U	C
Nickel 63	13981-37-8	0.059	1.1	1.8	30	U	NI_L
Total Strontium	SR-RAD	-0.086	0.13	0.29	1.0	U -	SR
Technetium 99	14133-76-7	0.225	0.28	0.55	15	U	TC
Thorium 228	14274-82-9	0	0.10	0.24		U	TH
Thorium 230	14269-63-7	0.125	0.15	0.19	1.0	U	TH
Thorium 232	TH-232	0	0.050	0.19	1.0	U	TH
Uranium 233/234	U-233/234	0	0.045	0.17	1.0	U	U
Uranium 235	15117-96-1	0	0.055	0.21	1.0	U	U
Uranium 238	U-238	0	0.045	0.17	1.0	บ	Ŭ
Neptunium 237	13994-20-2	0	0.009	0.033	1.0	U	NP
Plutonium 238	13981-16-3	0	0.096	0.37	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.096	0.37	1.0	U	PU
Curium 243/244	CM-243/244	0.053	0.11	0.20	1.0	U	TP
Americium 241	14596-10-2	0.027	0.11	0.20	1.0	U	TP
Potassium 40	13966-00-2	U		0.37		U	GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Niobium 94	14681-63-1	U		0.016		U .	GAM
Cesium 134	13967-70-9	U		0.018		Ū	GAM
Cesium 137	10045-97-3	U		0.018	0.10	Ū	GAM
Radium 226	13982-63-3	Ū		0.034	0.10	U	GAM
Radium 228	15262-20-1	Ū		0.090	0.20	U	GAM
Europium 152	14683-23-9	U		0.051	0.10	U	GAM
Europium 154	15585-10-1	U		0.059	0.10	U	GAM
Europium 155	14391-16-3	U		0.044	0.10	U	GAM
Thorium 228	14274-82-9	U		0.026		U	GAM
Thorium 232	TH-232	U		0.090		U	GAM
Uranium 235	15117-96-1	U		0.072		U	GAM

216-Z-11 Ditch Borehole Samples

METHOD BLANKS

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R205097-03

BLANK, cont.

Method Blank

	7284 Melissa C. Mannion	Client/Case no Contract	SDG_H1788
Lab sample id Dept sample id		Client sample id Material/Matrix SAF No	SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 238 Americium 241	U-238 14596-10-2	U U		2.3 0.068		ប ប	GAM GAM

216-Z-11 Ditch Borehole Samples

QC-BLANK 42154

METHOD BLANKS

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SAMPLE DELIVERY GROUP H1788

R205097-02

LAB CONTROL SAMPLE

Lab Control Sample

SDG <u>7284</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> S Case no <u>No. 630</u>	SDG_H1788
Lab sample id <u>R205097-02</u> Dept sample id <u>7278-002</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix	SOLID
	SAF No <u>B02-050</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	10.9	0.55	0.49	400	J	Н	11.8	0.47	92	83-117	80-120
Carbon 14	10700	210	30	50		С	11300	450	95	84-116	80-120
Nickel 63	263	4.7	1.8	30		NI_L	276	11	95	84-116	80-120
Total Strontium	22.3	0.82	0.24	1.0		SR	22.6	0.90	99	83-117	80-120
Technetium 99	120	3.2	0.54	15		TC	120	4.8	100	83-117	80-120
Thorium 230	46.3	3.8	0.24	1.0		TH	44.8	1.8	103	84-116	80-120
Uranium 233/234	19.7	1.8	0.82	1.0		U	19.3	0.77	102	83-117	80-120
Uranium 235	14.7	1.5	0.19	1.0		U	15.7	0.63	94	83-117	80-120
Uranium 238	20.3	1.8	0.79	1.0		U	21.0	0.84	97	84-116	80-120
Neptunium 237	21.0	1.1	0.14	1.0		NP	21.8	0.87	96	88-112	80-120
Plutonium 238	24.1	3.0	0.33	1.0		PU	27.0	1.1	89	81-119	80-120
Plutonium 239/240	28.9	3.5	0.33	1.0		PU	29.0	1.2	100	79-121	80-120
Curium 243/244	20.7	1.9	0.17	1.0		TP	21.2	0.85	98	84-116	80-120
Americium 241	18.6	1.7	0.17	1.0		TP	_21.0	0.84	89	85-115	80-120
Cobalt 60	0.963	0.067	0.038	0.050		GAM	1.00	0.040	96	75-125	80-120
Cesium 137	1.28	0.058	0.040	0.10		GAM	1.25	0.050	102	75-125	80-120

216-Z-11 Ditch Borehole Samples

QC-LCS 42153

Note: LSC sample was spiked with Cm-244 only.

LAB CONTROL SAMPLES
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R205121-02

DUPLICATE

B14KC7

SDG	7284			Client/Case no <u>Hanford</u>	SDG	н1788
Contact	Melissa C. Mannion			Case no <u>No. 630</u>	<u>.</u>	
	DUPLICATE		ORIGINAL			
Lab sample id	R205121-02	Lab sample id	R205121-01	Client sample id <u>B14KC7</u>	····	
Dept sample id	7284-002	Dept sample id	7284-001	Location/Matrix 200 W		SOLID
		Received	05/22/02	Collected/Weight <u>05/17/02 11:05</u>	1745 g	
% solids	92.0	% solids	92.0	Custody/SAF No B02-050-27	B02-050	

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ PROT
Tritium	0.159	0.11	0.18	400	U	Н	0.129	0.10	0.17	U	-	
Carbon 14	-2.31	2.4	4.2	50	U	С	-0.536	2.2	3.7	U	-	
Nickel 63	0.193	1.2	2.0	30	U	NI_L	~0.214	1.2	2.0	U	-	
Total Strontium	-0.004	0.11	0.19	1.0	U	SR	-0.132	0.10	0.19	U	. -	
Technetium 99	0.082	0.28	0.59	15	U	TC	0.170	0.30	0.57	υ	-	
Thorium 228	0.373	0.27	0.26			TH	0.776	0.32	0.32		70	110
Thorium 230	0.373	0.27	0.26	1.0	J	TH	0.491	0.26	0.20	j	27	131
Thorium 232	0.576	0.27	0.26	1.0	J	TH	0.698	0.26	0.20	J	19	89
Uranium 233/234	0.336	0.18	0.17	1.0	J	U	0.300	0.17	0.16	J	11	117
Uranium 235	0.027	0.054	0.21	1.0	U	U	0	0.052	0.20	U	-	
Uranium 238	0.269	0.14	0.17	1.0	j	U	0.258	0.13	0.16	j	4	109
Neptunium 237	0	0.018	0.049	1.0	U	NP	0.004	0.017	0.032	U	-	
Plutonium 238	0	0.062	0.24	1.0	Ú	PU	0	0.075	0.29	U	-	
Plutonium 239/240	0	0.062	0.24	1.0	U	PU	0	0.075	0.29	U	-	
Curium 243/244	0	0.086	0.21	1.0	U	TP	-0.047	0.047	0.18	U	-	
Americium 241	-0.021	0.086	0.16	1.0	U	TP	0.212	0.19	0.18	J	200	269
Potassium 40	11.0	0.95	0.46			GAM	10.2	3.1	0.40		8	56
Cobalt 60	U		0.039	0.050	U	GAM	U		0.039	U	-	
Niobium 94	U		0.033		U	GAM	U		0.032	U	-	
Cesium 134	υ		0.047		U	GAM	U		0.044	U	-	
Cesium 137	U		0.041	0.10	υ	GAM	U		0.036	υ	-	
Radium 226	0.262	0.079	0.087	0.10		GAM	0.236	0.11	0.064		10	88
Radium 228	0.525	0.15	0.16	0.20		GAM	0.582	0.19	0.15		10	73
Europium 152	U		0.10	0.10	U	GAM	U		0.081	U	-	
Europium 154	U		0.13	0.10	U	GAM	U		0.11	U	-	
Europium 155	U		0.099	0.10	U	GAM	U		0.065	U	-	
Thorium 228	0.602	0.075	0.077			GAM	0.631	0.095	0.064		5	43
Thorium 232	0.525	0.15	0.16			GAM	0.582	0.19	0.15		10	73

216-Z-11 Ditch Borehole Samples

DUPLICATES
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R205121-02

DUPLICATE, cont.

B14KC7

SDG <u>7284</u>		Client/Case no <u>Hanford</u> <u>SDG H1788</u>
Contact <u>Melissa C. Mannion</u>		Case no No. 630
DUPLICATE	ORIGINAL	
Lab sample id <u>R205121-02</u>	Lab sample id <u>R205121-01</u>	Client sample id B14KC7
Dept sample id <u>7284-002</u>	Dept sample id <u>7284-001</u>	Location/Matrix 200 W SOLID
	Received <u>05/22/02</u>	Collected/Weight <u>05/17/02 11:05</u> <u>1745 g</u>
% solids <u>92.0</u>	% solids <u>92.0</u>	Custody/SAF No <u>B02-050-27</u> <u>B02-050</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3 <i>σ</i> τοτ ι	PROT LIMIT
Uranium 235	U		0.25		U	GAM	U		0.11	U	-		
Uranium 238	U		4.8		U	GAM	U		3.9	U	-		
Americium 241	U		0.16		U	GAM	U		0.033	U			

216-Z-11 Ditch Borehole Samples

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DUPLICATES
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R205121-01

DATA SHEET

B14KC7

	G <u>7284</u> Melissa C. Mannion	Client/Case no Contract		SDG	H1788
I		Client sample id Location/Matrix Collected/Weight Custody/SAF No	200 W 05/17/02 11:05	1745 q B02-050	SOLID

ANALYTÉ	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI~ FIERS	TEST
Tritium	10028-17-8	0.129	0.10	0.17	400	U	Н
Carbon 14	14762-75-5	-0.536	2.2	3.7	50	U	C
Nickel 63	13981-37-8	-0.214	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	-0.132	0.10	0.19	1.0	Ū ·	SR
Technetium 99	14133-76-7	0.170	0.30	0.57	15	U	TC
Thorium 228	14274-82-9	0.776	0.32	0.32			TH
Thorium 230	14269-63-7	0.491	0.26	0.20	1.0	J	TH
Thorium 232	TH-232	0.698	0.26	0.20	1.0	J	TH
Uranium 233/234	U-233/234	0.300	0.17	0.16	1.0	J	U
Uranium 235	15117-96-1	0	0.052	0.20	1.0	U	U
Uranium 238	U-238	0.258	0.13	0.16	1.0	J	U
Neptunium 237	13994-20-2	0.004	0.017	0.032	1.0	U	NP
Plutonium 238	13981-16-3	00	0.075	0.29	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.075	0.29	1.0	U	PU
Curium 243/244	CM-243/244	-0.047	0.047	0.18	1.0	U	TP
Americium 241	14596-10-2	0.212	0.19	0.18	1.0	J	TP
Potassium 40	13966-00-2	10.2	3.1	0.40			GAM
Cobalt 60	10198-40-0	U		0.039	0.050	U	GAM
Niobium 94	14681-63-1	U		0.032		U	GAM
Cesium 134	13967-70-9	U		0.044		U	GAM
Cesium 137	10045-97-3	U		0.036	0.10	U	GAM
Radium 226	13982-63-3	0.236	0.11	0.064	0.10		GAM
Radium 228	15262-20-1	0.582	0.19	0.15	0.20		GAM
Europium 152	14683-23-9	U		0.081	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.065	0.10	U	GAM
Thorium 228	14274-82-9	0.631	0.095	0.064			GAM
Thorium 232	TH-232	0.582	0.19	0.15			GAM

216-Z-11 Ditch Borehole Samples

DATA SHEETS

Page 1

SUMMARY DATA SECTION

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R205121-01

B14KC7

DATA SHEET, cont

SDG	7284	Client/Case no	Hanford	SDG_H1788
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R205121-01	Client sample id	B14KC7	
Dept sample id	7284-001	Location/Matrix	200 W	SOLID
Received	05/22/02	Collected/Weight	05/17/02 11:05	<u>1745 q</u>
% solids	92.0	Custody/SAF No	B02-050-27	B02-050

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		3.9		U	GAM
Americium 241	14596-10-2	Ŭ		0.033		U ·	GAM

216-Z-11 Ditch Borehole Samples

DATA SHEETS

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H1788

Test NP Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

NEPTUNIUM IN SOIL
ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1788</u>

RESULTS

CLIENT SAMPLE ID		AW SUF- EST FIX PLANCHET	Neptunium 237		
Preparation batch 7036-	049				
B14KC7	R205121-01	7284-001	U		
BLK (QC ID=42154)	R205097-03	7278-003	U		
LCS (QC ID=42153)	R205097-02	7278-002	ok		
Duplicate (R205121-01)	R205121-02	7284-002	- U		
Nominal values and limi 216-Z-11 Ditch Borehole		RDLs (pCi/g)	1.0		·

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ 9	PREP FAC	DILU- TION	YIELD %			FWHM keV	 	PREPARED	ANAL - YZED	DETECTOR
Preparation batch 7036-0	149 2 <i>σ</i> pr	ep eri	or 5.0	0 % Re	ference	Lab N	lotebook	7036	pg.	049					
B14KC7	R205121-01			0.032	0.500			68		812		54	07/09/02	07/10	SS-041
BLK (QC ID=42154)	R205097-03			0.033	0.500			65		812			07/09/02	07/10	SS-039
LCS (QC ID=42153)	R205097-02			0.14	0.500			33		812			07/09/02	07/10	ss-033
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.049	0.500			69		812		54	07/09/02	07/10	SS-042
Nominal values and limit	s from metho	d		1.0	0.500			20-10	5	100	- pr prog - 20,0	180			

PROCEDURES	REFERENCE	NP237_LLE_PLATE_AEA
1	CP-060	Soil Preparation, rev 3
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-934	Neptunium from Solids and Water by Extraction
		Chromatography, rev 2

AVERAGES ± 2 SD	MDA _	0.064	±	0.10
FOR 4 SAMPLES	YIELD	59	±	35

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SUMMARY DATA SECTION
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 Lab id TMANC

 Protocol Hanford

 Version Ver 1.0

 Form DVD-CMS

 Version 3.06

 Report date 07/10/02

SAMPLE DELIVERY GROUP H1788

Test PU Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHE	Pluton T 238		Plutoni 239/24		
Preparation batch 7036-	049						
B14KC7	R205121-01	7284-00	1 . U		U		
BLK (QC ID=42154)	R205097-03	7278-00	3 U		U		
LCS (QC ID=42153)	R205097-02	7278-00	2 ok		ok		
Duplicate (R205121-01)	R205121-02	7284-00	2 -	U	-	U	
Nominal values and limi 216-Z-11 Ditch Borehole		d RDLs (pCi/	g) 1.0		1.0		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MD/ pCi/g	A ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %			DRIFT KeV		PREPARED	ANAL - YZED	DETECTOR
Preparation batch 7036-0		ep er	ror 5.	0 % Re	eference	Lab N	lotebool	7036	pg.	049			open chemiste in en	- -		POWERENCE AND ADDRESS OF THE PARTY OF THE PA
B14KC7	R205121-01			0.29	0.500			58		109			49	07/05/02	07/05	ss-048
BLK (QC ID=42154)	R205097-03			0.37	0.500			47		108				07/05/02	07/05	SS-042
LCS (QC ID=42153)	R205097-02			0.33	0.500			50		108				07/05/02	07/05	SS-041
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.24	0.500			75		109			49	07/05/02	07/05	\$\$-049
Nominal values and limit	s from metho	od	eroonia eroonia eroonia	1.0	0.500			20-10	5	100	100		180			adassas para partir de la controlaçõe consume

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	CP-060	Soil Preparation, rev 3
•	CP-940	Plutonium Separation and Purification, rev 3
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD	MDA	0.31	±	0.11
FOR 4 SAMPLES	YIELD	58	±	25

METHOD SUMMARIES
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SUMMARY DATA SECTION
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SAMPLE DELIVERY GROUP H1788

Test TH Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client	Hanford
Contract	No. 630
Contract	SDG_H1788

RESULTS

LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Thorium 230			
0	salan di de Cita da Manda de Constructor de Constru	CONTRACTOR OF THE STATE OF THE			
	739/ 001	0 401 1			
K205121-01	, == , == ,	0.491 J			
R205097-03	7278-003	U			
R205097-02	7278-002	ok			
R205121-02	7284-002	ok J			
	d RDLs (pCi/g)	1.0		, , , , , , , , , , , , , , , , , , , ,	
	9 R205121-01 R205097-03 R205097-02 R205121-02	9 R205121-01 7284-001 R205097-03 7278-003 R205121-02 7284-002 from method RDLs (pCi/g)	9 R205121-01 7284-001 0.491 J R205097-03 7278-003 U R205121-02 7284-002 ok R205121-02 7284-002 ok J from method RDLs (pCi/g) 1.0	9 R205121-01 7284-001 0.491 J R205097-03 7278-003 U R205097-02 7278-002 ok R205121-02 7284-002 ok J from method RDLs (pCi/g) 1.0	SAMPLE ID TEST FIX PLANCHET Thorium 230 9 R205121-01 7284-001 0.491 J R205097-03 7278-003 U R205097-02 7278-002 ok R205121-02 7284-002 ok J from method RDLs (pCi/g) 1.0

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST		MAX MD pCi/g	A ALIQ	PREP FAC	DILU- TION	YIELD %	EFF %		DRIFT KeV		PREPARED	ANAL - YZED	DETECTOR
Preparation batch 7036-0	49 2 <i>σ</i> pr	ep err	or 5.0	% R	eference	Lab N	lotebook	7036	pg.	049		,			
B14KC7	R205121-01			0.20	0.250			102		176		53	07/09/02	07/09	ss-041
BLK (QC ID=42154)	R205097-03			0.19	0.250			105		176			07/09/02	07/09	SS-039
LCS (QC ID=42153)	R205097-02			0.24	0.250			106		175			07/09/02	07/09	ss-033
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.26	0.250			83		176		53	07/09/02	07/09	SS-042
Nominal values and limit	s from metho	d		1.0	0.250			20-10	5	150		180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-070	Soil Dissolution, < 1.0g Aliquot, rev 4
	CP-905	Thorium in Water and Dissolved Solid Sample
		Using TRU and AG 1x8 Resin, rev 1
	CP-008	Heavy Element Electroplating, rev 6
	,	

AVERAGES ± 2 SD MDA 0.22 ± 0.066 FOR 4 SAMPLES YIELD 99 ± 22

METHOD SUMMARIES

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H1788

Test TP Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY AMERICIUM 241/CURIUM IN SOLIDS ALPHA SPECTROSCOPY

Client Hanford

Contract No. 630

Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Curium 243/244	Americium 241		
Preparation batch 7036-	049				A CONTRACTOR OF THE CONTRACTOR	<u>функция (такжения) профинация сынасымых стакжения (такжения).</u>
B14KC7	R205121-01	7284-001	U	0.212 J		
BLK (QC ID=42154)	R205097-03	7278-003	U	U		
LCS (QC ID=42153)	R205097-02	7278-002	ok	ok		
Duplicate (R205121-01)	R205121-02	7284-002	- U	ok U		
Nominal values and limi 216-Z-11 Ditch Borehole		d RDLs (pCi/g)	1.0	1.0		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MAX MDA pCi/g	ALIQ g		DILU-	YIELD %				DRIFT KeV		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7036-0	49 2 <i>σ</i> pr	ep error 5	.0 % Re	ference	Lab N	otebook	7036	pg.	049						
B14KC7	R205121-01		0.18	0.500			84		116			49	07/05/02	07/05	SS-040
BLK (QC ID=42154)	R205097-03		0.20	0.500			77		115				07/05/02	07/05	ss-033
LCS (QC ID=42153)	R205097-02		0.17	0.500			88		115				07/05/02	07/05	ss-032
Duplicate (R205121-01) (QC ID=42157)	R205121-02		0.21	0.500			94		117			49	07/05/02	07/05	SS-041
Nominal values and limit	s from metho	d	1.0	0.500			20-105	5	100	100		180	***************************************		

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	CP-002	Q.C. Preparation, rev 3
	CP-003	Tracing, rev 3
	CP-940	Plutonium Separation and Purification, rev 3
	CP-961	Am-Cu Purification, Large Aliquot by Oxalate
		Precipitation, rev 2
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD MDA 0.19 ± 0.037 FOR 4 SAMPLES YIELD 86 ± 14

METHOD SUMMARIES

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SUMMARY DATA SECTION

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SAMPLE DELIVERY GROUP H1788

Test <u>U</u> Matrix <u>SOLID</u> SDG <u>7284</u>

Contact Melissa C. Mannion

METHOD SUMMARY

URANIUM, ISOTOPIC IN SOIL
ALPHA SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1788</u>

RESULTS

	LAB	RAW SUF-	1: Uranium	2: Uranium	3: Uranium	RESU	LT RAT	IOS ((%)
CLIENT SAMPLE ID	SAMPLE ID	TEST FIX PLANCHET	233/234	235	238	1÷3	2σ	2÷3	2σ
Preparation batch 7036-	049	The state of the s					Water		
B14KC7	R205121-01	7284-001	0.300 J	U	0.258 J	116	88	0	20
BLK (QC ID=42154)	R205097-03	7278-003	U	U	U				
LCS (QC ID=42153)	R205097-02	7278-002	ok	ok	ok				
Duplicate (R205121-01)	R205121-02	7284-002	ok J	- U	ok J	125	93	10	21
Nominal values and limi	ts from metho	d RDLs (pCi/g)	1.0	1.0	1.0	100		4	Name and the later
216-Z-11 Ditch Borehole	Samples					Averages 121		5	

METHOD PERFORMANCE

CLIENT SAMPLE ID	SAMPLE ID	RAW SUF		A ALIQ	PREP FAC	DILU-	YIELD %	EFF %		FWHM keV		PREPARED	ANAL - YZED	DETECTOR
Preparation batch 7036-	049 2 <i>σ</i> pr	ep error	5.0 % F	Reference	Lab N	Votebook	7036	pg.	049					
B14KC7	R205121-01		0.20	0.500			96		109		49	07/05/02	07/05	SS-044
BLK (QC ID=42154)	R205097-03		0.21	0.500			96		108			07/05/02	07/05	ss-033
LCS (QC ID=42153)	R205097-02		0.82	0.500			103		108			07/05/02	07/05	ss-032
Duplicate (R205121-01) (QC ID=42157)	R205121-02		0.21	0.500			97		109		49	07/05/02	07/05	SS-047
Nominal values and limi	ts from metho	od	1.0	0.500		***************************************	20-105	5	100	100	 180			

PROCEDURES	REFERENCE CP-911	UISO_PLATE_AEA Uranium in Water and Dissolved Sample by
	CP-008	Extraction Chromatography, rev 3 Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD MDA 0.36 ± 0.61 FOR 4 SAMPLES YIELD 98 ± 7

METHOD SUMMARIES
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SAMPLE DELIVERY GROUP H1788

Test <u>SR</u> Matrix <u>SOLID</u>
SDG <u>7284</u>
Contact <u>Melissa C. Mannion</u>

METHOD SUMMARY

TOTAL STRONTIUM IN SOIL
BETA COUNTING

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1788</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Total Strontium		
Preparation batch 7036-	049			1997/00/2019/00/	
B14KC7	R205121-01	7284-001	U		
BLK (QC ID=42154)	R205097-03	7278-003	U		
LCS (QC ID=42153)	R205097-02	7278-002	ok		
Duplicate (R205121-01)	R205121-02	7284-002	- U		
Nominal values and limi 216-Z-11 Ditch Borehole		d RDLs (pCi/g)	1.0	•	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST		MDA pCi/g		PREP FAC		YIELD %	EFF %			DRIFT KeV		PREPARED	ANAL - YZED	DETECTOR
Preparation batch 7036-0	049 2 <i>σ</i> pi	rep er	ror 10	.0 %	Reference	Lab	Notebook	7036	pg.	049						
B14KC7	R205121-01			0.19	1.00			99		200			49	07/05/02	07/05	GRB-221
BLK (QC ID=42154)	R205097-03			0.29	1.00			95		100				07/05/02	07/05	GRB-219
LCS (QC ID=42153)	R205097-02			0.24	1.00			98		98				07/05/02	07/05	GRB-229
Duplicate (R205121-01) (QC ID=42157)	R205121-02			0.19	1.00			95		200			49	07/05/02	07/05	GRB-222
Nominal values and limit	ts from metho	od		1.0	1.00			30-105	5	100	2	P harri - en handelet de de dadistración de	180			

PROCEDURES	REFERENCE	SRTOT_SEP_PRECIP_GPC
	CP-502	Strontium in Solids, rev 4
	CP-519	Strontium Planchet Demounting and Preparation for
		90Y Decontamination, rev 3

AVERAGES ± 2 SD MDA 0.23 ± 0.096 FOR 4 SAMPLES YIELD 97 ± 4

METHOD SUMMARIES
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Page 20

SAMPLE DELIVERY GROUP H1788

Test TC Matrix SOLID

SDG 7284

Contact Melissa C. Mannion

METHOD SUMMARY

TECHNETIUM 99 IN SOIL
BETA COUNTING

Client	Hanford
Contract	No. 630
Contract	SDG_H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Technetium 99			
Preparation batch 7036-	049			aggaring and all the second and		
B14KC7	R205121-01	7284-001	U			
BLK (QC ID=42154)	R205097-03	7278-003	U			
LCS (QC ID=42153)	R205097-02	7278-002	ok			
Duplicate (R205121-01)	R205121-02	7284-002	- U			
Nominal values and limi 216-Z-11 Ditch Borehole		d RDLs (pCi/g)	15			

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE	RA ID TE	J SUF			PREP FAC		YIELD %	EFF %			DRIFT KeV		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7036-	049 24	<i>т</i> ргер	error	10.0 %	Reference	Lab	Notebook	7036	pg.	049	************					
B14KC7	R205121	-01		0.57	1.02			90		50			46	06/28/02	07/02	GRB-217
BLK (QC ID=42154)	R205097	-03		0.55	1.00			93		50				06/28/02	07/01	GRB-203
LCS (QC ID=42153)	R205097	-02		0.54	1.00			96		50				06/28/02	07/02	GRB-230
Duplicate (R205121-01) (QC ID=42157)	R205121	-02		0.59	1.02			85		50			46	06/28/02	07/02	GRB-218
Nominal values and limi	ts from m	ethod		15	1.00			20-10	5	50			180			

PROCEDURES	REFERENCE	TC99_TR_SEP_LSC
	CP-060	Soil Preparation, rev 3
	CP-021	Preparation of Tc-99m Tracer, rev 1
	CP-002	Q.C. Preparation, rev 3
	CP-003	Tracing, rev 3
	CP-542	Technetium-99 Purification (Soil) by Extraction
-		Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 6

AVERAGES ± 2 SD	MDA	0.56	±	0.044
FOR 4 SAMPLES	YIELD	91	±	9

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SAMPLE DELIVERY GROUP H1788

Test GAM Matrix SOLID
SDG 7284
Contact Melissa C. Mannion

METHOD SUMMARY

GAMMA SCAN
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H1788

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Cobalt 60	Cesium 137	
Preparation batch 7036-	049		AND THE CONTRACT OF THE CONTRA		
B14KC7	R205121-01	7284-001	U	U	
BLK (QC ID=42154)	R205097-03	7278-003	U	U	
LCS (QC ID=42153)	R205097-02	7278-002	ok	ok	
Duplicate (R205121-01)	R205121-02	7284-002	- U	U	
Nominal values and limi 216-Z-11 Ditch Borehole		RDLs (pCi/g)	0.050	0.10	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MDA pCi/g	AL IQ	PREP FAC	DILU- TION	YIELD %			_		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7036-0	049 2 <i>σ</i> pr	ep error 1	5.0 % Re	ference	Lab N	otebool	7036	pg.	049					
B14KC7	R205121-01		0.30	185					718		46	07/01/02	07/02	JR,07,00
BLK (QC ID=42154)	R205097-03		0.17	209					718			07/01/02	07/02	JR,05,00
LCS (QC ID=42153)	R205097-02		0.038	209					718			07/01/02	07/02	JR,03,00
Duplicate (R205121-01) (QC ID=42157)	R205121-02		0.37	185					410		 47	07/01/02	07/03	JR,05,00
Nominal values and limi	ts from metho	od	0.050	209					100		180			

PROCEDURES	REFERENCE	GAMMA_GS
	CP-060	Soil Preparation, rev 3
	CP-100	Ge(Li) Preparation for Commercial Samples, rev 3

AVERAGES ± 2 SD	MDA _	0.22	±	0.29
FOR 4 SAMPLES	YIELD _		±	

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SAMPLE DELIVERY GROUP H1788

Test C Matrix SOLID

SDG 7284

Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN SOIL
LIQUID SCINTILLATION COUNTING

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1788</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Carbon 14		
Preparation batch 7036-	049	A THE COMMON THE STATE OF THE COMMON THE STATE OF THE STA	en de la companya de la contractiva de	PONTED CONTROL OF THE PARTY OF	
B14KC7	R205121-01	7284-001	U		
BLK (QC ID=42154)	R205097-03	7278-003	U		
LCS (QC ID=42153)	R205097-02	7278-002	ok		
Duplicate (R205121-01)	R205121-02	7284-002	- U		
Nominal values and limi 216-Z-11 Ditch Borehole		d RDLs (pCî/g)	50		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST		DA ALIQ /g g	PREP FAC		YIELD %	EFF %		FWHM keV		PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7036-0	149 2σ pr	ep err	or 10.0 %	Reference	Lab	Notebook	7036	pg.	049					MANAGEMENT OF STREET
B14KC7	R205121-01		3.	7 0.269			100		100		43	06/28/02	06/29	LSC-004
BLK (QC ID=42154)	R205097-03		4.	7 0.200			100		100			06/28/02	06/28	LSC-004
LCS (QC ID=42153)	R205097-02		30	0.200			100		2			06/28/02	06/29	LSC-004
Duplicate (R205121-01) (QC ID=42157)	R205121-02		4.	2 0.229			100		100		43	06/28/02	06/29	LSC-004
Nominal values and limit	s from metho	d	50	0.200				PANEY of manufactures	50		180			

PROCEDURES	REFERENCE	C14_COX_LSC
	CP-060	Soil Preparation, rev 3
	CP-251	Tritium/Carbon-14 Oxidation, rev 3

AVERAGES ± 2 SD MDA 11 ± 26

FOR 4 SAMPLES YIELD 100 ± 0

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SAMPLE DELIVERY GROUP H1788

Test H Matrix SOLID

SDG 7284

Contact Melissa C. Mannion

METHOD SUMMARY

TRITIUM IN SOIL
LIQUID SCINTILLATION COUNTING

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1788</u>

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX PLANCHET	Trit	ium		
Preparation batch 7036-	049		CONTRACTOR CONTRACTOR CONTRACTOR	Negativisia (Internativisia de la companio del companio de la companio de la companio del companio de la companio del la companio de la compa		
B14KC7	R205121-01	7284-001	U			
BLK (QC ID=42154)	R205097-03	7278-003	U			
LCS (QC ID=42153)	R205097-02	7278-002	ok	J		
Duplicate (R205121-01)	R205121-02	7284-002	-	U		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW S			PREP FAC	DILU- TION	YIELD %			 DRIFT KeV		PREPARED	ANAL - YZED	DETECTOR
Preparation batch 7036-	049 2 <i>σ</i> pi	ep erro	or 10.0 %	Reference	Lab I	Notebool	7036	pg.	049			·		**************************************
B14KC7	R205121-01		0.17	21.8			47		120		46	07/01/02	07/02	LSC-004
BLK (QC ID=42154)	R205097-03		0.21	20.0			40		120			07/01/02	07/02	LSC-004
LCS (QC ID=42153)	R205097-02		0.49	20.0			17		120			07/01/02	07/01	LSC-004
Duplicate (R205121-01) (QC ID=42157)	R205121-02		0.18	20.6			46		120		46	07/01/02	07/02	LSC-004
Nominal values and limi	ts from metho	od	400	20.0					25		180			

PROCEDURES	REFERENCE	906.0_H3_LSC
	CP-060	Soil Preparation, rev 3
	CP-216	Tritium in Solid Samples by Azeotropic
		Distillation, rev 4
1		

AVERAGES ± 2 SD MDA 0.26 ± 0.31 FOR 4 SAMPLES YIELD 38 ± 28

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Lab id <u>TMANC</u>

Protocol <u>Hanford</u>

Version <u>Ver 1.0</u>

Form <u>DVD-CMS</u>

Version <u>3.06</u>

Report date <u>07/10/02</u>

SAMPLE DELIVERY GROUP H1788

Test <u>NI L</u> Matrix <u>SOLID</u> SDG <u>7284</u>

Contact Melissa C. Mannion

METHOD SUMMARY

NICKEL 63 IN SOIL
LIQUID SCINTILLATION COUNTING

Client <u>Hanford</u>
Contract <u>No. 630</u>
Contract <u>SDG H1788</u>

RESULTS

CLIENT SAMPLE ID		AW SUF- EST FIX PLANCHET	Nicke	el 63			
Preparation batch 7036-	049			Banco (1990) (1994) (1994) (1994) (1994)	AND THE RESIDENCE OF THE PROPERTY OF THE PROPE	en e	ONE AND ADDRESS OF THE PARTY OF
B14KC7	R205121-01	7284-001	U				
BLK (QC ID=42154)	R205097-03	7278-003	U				
LCS (QC ID=42153)	R205097-02	7278-002	ok				
Duplicate (R205121-01)	R205121-02	7284-002	-	U			
Nominal values and limi 216-Z-11 Ditch Borehole		RDLs (pCi/g)	30				

METHOD PERFORMANCE

	LAB	RAW	SUF- ME	A ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS		ANAL-	
CLIENT SAMPLE ID	SAMPLE ID	TEST	FIX pCi	'g g	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7036-0	149 2 <i>σ</i> pr	ep er	or 10.0 %	Reference	Lab I	Notebook	7036	pg.	049	1	in the second				
B14KC7	R205121-01		2.0	0.500			91		100			47	07/03/02	07/03	LSC-005
BLK (QC ID=42154)	R205097-03		1.8	0.500			97		100				07/03/02	07/03	LSC-005
LCS (QC ID=42153)	R205097-02		1.8	0.500			96		100				07/03/02	07/03	LSC-005
Duplicate (R205121-01) (QC ID=42157)	R205121-02		2.0	0.500			89		100			48	07/03/02	07/04	LSC-005
Nominal values and limit	s from metho	od	30	0.500		***************************************	30-10	5	50			180			

PROCEDURES	REFERENCE	NI63_LSC
	CP-060	Soil Preparation, rev 3
	CP-431	Nickel-63 Purification, rev 4

AVERAGES ± 2 SD	MDA	1.9	±	0.23
FOR 4 SAMPLES	YIELD	93	±	8

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SAMPLE DELIVERY GROUP H1788

SDG 7284
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REPORT GUIDE

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SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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SAMPLE DELIVERY GROUP H1788

SDG 7284
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REPORT GUIDE

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PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified.
 Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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SAMPLE DELIVERY GROUP H1788

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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SAMPLE DELIVERY GROUP H1788

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H Similar to 'L' except the recovery was high.
- P The RESULT is 'preliminary'.
- X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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SAMPLE DELIVERY GROUP H1788

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DATA SHEET

- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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SAMPLE DELIVERY GROUP H1788

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- The first, computed limits for the recovery reflect:
 - 1. The error of RESULT, including that introduced by rounding the result prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

- 2. The error of ADDED.
- 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

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Lab id TMANC

Protocol Hanford Version Ver 1.0

Form DVD-RG

Version 3.06

Report date <u>07/10/02</u>

SAMPLE DELIVERY GROUP H1788

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:
 - 1. A fixed percentage specified in the protocol.

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DUPLICATE

- 2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.
- * The RPD is underlined if it is greater than either limit.
- * If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.
 - If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.
- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.
 - An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.
- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.
- * The first, computed limits for the recovery reflect:
 - 1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.
 - If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
 - 2. The error of ADDED.
 - 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits

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SAMPLE DELIVERY GROUP H1788

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MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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SAMPLE DELIVERY GROUP H1788

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REPORT GUIDE

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

- * Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- * If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

- * Aliquots are underlined if less than the nominal value specified for the method.
- * Prepareation factors are underlined if greater than the nominal value specified for the method.
- * Dilution factors are underlined if greater than the nominal value specified for the method.
- * Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.
- * Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.
- * Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

REPORT GUIDES
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SUMMARY DATA SECTION
Page 38

SAMPLE DELIVERY GROUP H1788

SDG 7284
Contact Melissa C. Mannion

GUIDE, cont.

Client	Hanford					
Contract	No. 630					
Case no	SDG_H1788					

METHOD SUMMARY

- * Count times are underlined if less than the nominal value specified for the method.
- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

REPORT GUIDES

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SAMPLE DELIVERY GROUP H1788

SDG 7284
Contact Melissa C. Mannion

GUIDE, cont.

Client	Hanford				
Contract	No.	630			
Case no	SDG	H1788			

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

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Bechtel Hanfor	d Inc.	C	HAIN OF CUS	TODY/S	AMPL	E ANAL	YSIS	REQUEST	Γ	B 02	2-050-27	Page <u>I</u>	of <u>1</u>
Collector FAHLBERG			oany Contact ACQUES	Telephone No. 372-9651			Project Coordinator TRENT, SJ		Price Code 8N		Data Turnaround		
Project Designation 216-Z-11 Ditch Borehole Sam	ples	Samp	3. T (*	1788 (7284)			SAF No. B02-050		Air Quality 🗌		45 Days		
Ice Chest No. SEE	OSPC		Logbook No. 1517~ 3		COA B20CW5	674C		Method of Ship Fed EX	ment				
Shipped To (TMA)RECRA		Offsit	e Property No. 77	10 Zc	15 2	2		Bill of Lading/	Air Bill N	10. SE B		SPC	
POSSIBLE SAMPLE HAZAI	RDS/REMARKS											,,,	
TIETOI	314 LK1	-{	Preservation	Cool 4C	Cool 4C	Cool 4C	Cool		Cool 40		None	None	
Special Handling and/or S	Storage	•	Type of Container	 - 	aG	P	aG	aG O	2	aG	P	aG	
	. 10		No. of Container(s)	1	1	1	1	5 3	1	1	(1)	(1)	
N	one		Volume	250mL	120mL	1000mL	1250	1 250mL	250mI.	120mL	1000mL	120mL	
	SAMPLE ANAL	YSIS		See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	PCBs -	8082 See item (3) in Special Instructions.	See item (4 Special Instructio	Range -	See item (5) in Special Instructions.	See item (6) in Special Instructions.	tie to
Sample No.	Matrix *	Sample Date	Sample Time	1									
B14KC7	SOIL /	5.17.0 8	2/1105	and the second							XV	Xd	BIYLK4
							J		10 72				
							. relinq	nnel not availabluish samples fro	m the 372	28			
							, Kei #	<u>74 on 5 /</u>	<u>25/02</u> 1				
CHAIN OF POSSESSIO	N	Sign/Pri	nt Names	<u> </u>	SPE	L CIAL INSTR	UCTIO	DNS	<u> </u>			I	Matrix *
Relinquished By/Removed From R-F-LLL Relinquished By/Removed From Relinquished By/Removed From Relinquished By/Removed From Relinquished By/Removed From F-W-EXP L-VS	Date/Time X2 3728 521- Date/Time 100 Date/Time 16	Received By/Sto	red In RTh ore ored In RTh ore ored In RTh ore	Date/Time O 5 · 21 · C Date/Time 5 - 21 - Date/Time	(t) IEP Mol (2) (3) (4) (4)	ICP Metals - 60 Metals - 5010A ybdemum, Nicke IC Anions - 500 VOA - 8260A (Add-On) { Tetral Semi-VOA - 82	(Superura ol, Vanadi to (Fluori TCL); VC nydrofurar 70A (TCI	ertrace) (Arsenic, Bi te Add-On) (Derylli um, Zine); Mescury de, Nitrate, Sulfate; DA 8260A (Add-On) } _); Semis VOA = 827 {Cesium-134, Cesiu	um, Boron, -7470 - (C , Ammonia) (Trickler OA (Add.C	Copper, Magnesi - 350.3, NO2/NO cmonofluorometha h) {1,2,4-Trimoth	um, Manganese 3 - 353.1, Sulfi ane); VOA - 82 sylbenzene, Cyc	des = 9030 000A (App	SD=Sediment SD=Sediment SO=Solid SI=Slodge W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue Wi=Wipe L=Liquid
Relinquished By/Removed From	Date/Time	Received By/Sto		Date/Time	Euro Nep	pium-155, Niob tunium-237; Nio	oium-94, I okel-63; S	Radium-226, Radium trontium-89,90 To ricium-241/Curium-2	-228}; Isot tal Sr, Tech	opic Thorium (Th metium-99; Tritiu	orium-232}; C m - H3; Isotopi	arbon-14; c Uranium	V≃Vegetation X=Other
Relinquished By/Removed From	Date/Time	Received By/Sto	ored In	Date/Time	1 \ /	i-on) (Curium-2	-	Joidne 241/ Curiotte	· i.i. framen	ozoniczni, ruibli	orar 2711 Car		
LABORATORY Received By SECTION	,	1		Ti	tle						Ι	Date/Time	
FINAL SAMPLE Disposal Me	ethod					Dispo	osed By					Date/Time	

Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

CAUL	721 - 7284							<u> </u>	=
			SAMPLE F	RECEIPT		_ 6	al era		
Client:	Bechtel o. <u>802-05</u>	Han ford	Inc	_ Date/Tin	ne received _	5-22	-02	10:	30
CaC N	902 - 051	0-27							
Contail	o ner I.D. No. ERC-	-00-006 Re	quested T	AT (Days)	45 P.O	. Received	Yes []	No []
		-	INSPEC						
1	Custody seals on	shinnina contair	er intact?	,	Yes [~]	No[]	N	I/A []
1,	Custody seals on	shinning contair	ner dated 8	& signed?	Yes [~]	. No[]	N	I/A []
2.	Custody seals on				Yes []	No []	N	I/A []
3.	Custody seals on	sample contains	ers dated 8	& signed?	Yes []	No [١. ١	1/A []
4.	Packing material i				Wet[]	Dry [C	-]		
5.	Number of sample		ntainer:	2					
6.	Number of contai	ners per sample			(Or see CoC	<u> 2</u>	· }		***
7.	Paperwork agrees				Yes [2]	No [1		
8.	Samples have: Ta	ane [id Hazaro	d labels [] Rad labe	els [] Appr	opriate san	nple label	s [4	-]
9.	Samples are: In	good condition	[L] Lea	aking[]	Broken Cor	ntainer []	Missin	g []
10.	Describe any ano								
11.	Describe any and	1110,100.							
									
10	Was P.M. notifie	ad of any anoma	ilies? Yes	[-]	No [] [Date <u>5-</u> 2	12-04	2	
13.	Received by	A Posses	<u> </u>	Date:	5-22-0	之 Time:	10%.	32	
14.	Received by								
Custon	ner Sample		wino		r Sample o	cpm	mr/hr	wi	ре
	No. cpr	n mr/hr	wipe 						
								-	
lon Ch	namber Ser. No			Calibrat	ion date				
	meter Ser. No			Calibrat	ion date				
	y Meter Ser. No			Calibrat	tion date				
***************************************									•



1 July 2002

Joan Kessner Bechtel-Hanford, Inc. 3190 Washington Way MSIN H9-03 Richland, WA 99352

Subject: Contract No. 630

Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLl Batch #	
	0205L734
SDG#	H1788
SAF#	B02-050
Date Received	5-22-02
# Samples	1
Matrix	Soil
Volatiles	Χ
Semivolatiles	Χ
Pest/PCB	Х
DRO	X
GRO	
Metals	Χ
Inorganics	Χ

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

\$incerely,

Lipnville Laboratory Incorporated

Orlette S. Johnson Project Manager

Lionville Laboratory, Inc. VOA ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02

LVL LOT # :0205L734

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14KC7	001	S	02LVG145	05/17/02	N/A	05/29/02
B14KC7	001 MS	S	02LVG145	05/17/02	N/A	05/29/02
B14KC7	001 MSD	S	02LVG145	05/17/02	N/A	05/29/02
LAB QC:						
VBLKYX	MB1	S	02LVG145	N/A	N/A	05/29/02
	MB1 BS	S	02LVG145	N/A	N/A	05/29/02





Client: TNU-HANFORD B02-050

LVL#: 0205L734

SDG/SAF #: H1788/B02-050

W.O. #: 11343-606-001-9999-00 Date Received: 05-22-2002

GC/MS VOLATILE

One (1) soil sample was collected on 05-17-2002.

The sample and its associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260B for client specified volatile target compounds on 05-29-2002.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 2. The required analysis holding time was met.
- 3. Non-target compounds were not detected in the sample.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All matrix spike recoveries were within EPA QC limits.
- 6. All blank spike recoveries were within EPA QC limits.
- 7. The method blank contained the common laboratory contaminant Acetone at a level less than the CRQL.
- 8. Internal standard area and retention time criteria were met.
- 9. A spectral search was performed for the compounds Tetrahydrofuran; however, this compound was not detected in the sample.
- 10. "I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

/ J. Michael Taylor

President

Lionville Laboratory Incorporated

) well

Date

 $som\group\data\voa\tnu-hanford\0205-734.doc$

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 0 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

GLOSSARY OF VOA DATA

DATA QUALIFIERS

- U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- 1 = Interference.
- NQ = Result qualitatively confirmed but not able to quantify.
- Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.



GLOSSARY OF VOA DATA

ABBREVIATIONS

BS	about apouts	Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.



TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quantitation modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quantitation modifications:

- MP Missed Peak: manually added peak not found by automatic quantitation program.
- PA Peak Assignment: quantitation report was changed to reflect correct peak assignment.
- RI Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- PI Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.



L-WI-035/a-mi-10/00

Lionville Laboratory, Inc.

Volatiles by GC/MS, Appendix IX List

RFW Batch Number: 0205L734 Client: TNUHANFORD B02-050 H1788 Work Order: 11343606001 Page: 1a

Cust ID:	B14KC7	,	B14KC7		B14KC7		VBLKYX		VBLKYX BS	
Sample RFW#:	001	•	001 MS		001 MSD		02LVG145-M	B1	02LVG145-MB1	
Information Matrix:	SOIL		SOIL	_	SOIL	_	SOIL		SOIL	
D.F.:	1.0		_ 0.94		0.96		1.0		1.00	
Units:	ug/K	(g	ug/K	g	ug/K	.g	ug/K	.g	ug/Kg	
Toluene-d8	103	%	98	%	98	%	90	%	104 %	WARRAN
Surrogate Bromofluorobenzene	100	%	93	%	92	%	84	%	104 %	
Recovery 1,2-Dichloroethane-d4	93	%	90	%	92	%	86	%	102 %	
		=fl=		=fl=		=f1		=f1	======================================	-======fl
Chloromethane	12	U	10	U	11	U	10	U	10 U	
Bromomethane	12	U	10	U	11	U	10	U	10 U	
Vinyl Chloride	6	U	5	U	6	U	5	U	5 U	
Chloroethane	12	U	10	U	11	U	10	U	10 U	
Methylene Chloride	11		7		9		5	U	4 J	
Acetone	31	В	29	В	29	В	3	J	22 B	
Carbon Disulfide	6	U	5	U	6	U	5	U	5 U	
1,1-Dichloroethene	6	U	79	%	79	%	5	U	83 %	
1,1-Dichloroethane	6	U	5	U	6	U	5	U	5 U	
1,2-Dichloroethene (total)	6	U	5	U	6	U	5	U	5 U	
Chloroform	6	U	5	U	6	U	5	U	5 U	
1,2-Dichloroethane	6	U	5	U	6	U	5	U	5 U	
2-Butanone	12	U	10	U	11	U	10	U	10 U	
1,1,1-Trichloroethane	6	U	5	U	6	U	5	U	5 U	
Carbon Tetrachloride	4	U	3	U	3	U	3	U	3 U	
Bromodichloromethane	6	U	5	U	. 6	U	5	U	5 U	is .
1,2-Dichloropropane	6	U	5	U	6	U	5	U	5 U	
cis-1,3-Dichloropropene	6	U	5	U	6	U	5	Ū	5 U	
Trichloroethene	6	U	89	%	90	8	5	U	96 %	
Dibromochloromethane	6	U	5	U	• 6	U	5	U	5 U	
1,1,2-Trichloroethane	6	U	5	U	6	U	5	U	5 U	
Benzene	6	U	90	%	93	%	5	U	99 %	
Trans-1,3-Dichloropropene	6	U	5	U	6	U	5	U	5 U	
Bromoform	6	U	5	U	6	U	5	U	5 U	
4-Methyl-2-pentanone	12	U	10	U	11	U	10	U	10 U	
2-Hexanone	12	U	10	U	11	U	10	U	10 U	
Tetrachloroethene	6	U	5	U	. 6	U	5	U	5 U	
1,1,2,2-Tetrachloroethane		U	5	U	6	U	5	U	5 U	
Toluene	6	U	108	%	107	%	5	U	113 %	
to Outside of DDA GID OG limite										

^{*=} Outside of EPA CLP QC limits.



Report Date: 06/14/02 11:08

RFW Batch Number: 0205L7	734 Cli	ent: TNUH	ANFO	RD B02-050	H178	88 Work C	rde	r: 11343606	001	Paqe: 1b		
	Cust ID:	B14KC7		B14KC7		B14KC7		VBLKYX		VBLKYX BS		
	RFW#:	001		001 MS		001 MSD		02LVG145-M	в1	02LVG145-M	в1	
Chlorobenzene_		6	U	99	ે	100	%	5	U	105	%	· · · · · · · · · · · · · · · · · · ·
Ethylbenzene		6	U	5	U	6	U	5	U	5	U	
Styrene		6	U	5	U	6	U	5	U	5	U	
Xylene (total)		6	U	5	U	6	U	5	U	5	U	
Trichlorofluoromethane_		6	U	5	U	6	U	5	U	5	U	
Cyclohexanone		60	U	50	U	55	U	50	U	50	U	
1,2,4-Trimethylbenzene_		6	U	5	U	6	U	5	U	5	U	
*= Outside of EPA CLP QC	C limits.											

ionville Labora				Cı		_					ord/L				Re	qu	es	t Pa	age_	of		-	i	3/	V	,	
02050	734					FIELD	PERSO	NNEL	: COI	IPLETE	ONLY S	HADED	ARE	\mathcal{B}	C				D	E		F	G	in	PNAILLE E	ABORATOR	i in inc.
Client HAI	JFOR	27)			.54	¥#	B02	-09	0	Refrige	erator #		Ϊί	6	6				6	6		6	G			·	
Est. Final Pro			- 0				سرين			455	Container	Liquid	intere.						(\$\)	9 1	9. F)				10.8	191793 1917 1919	100
Project #	1 (7	343 -	60	6 - 0	001-	9999	} - 00	i dayaya Marija		#/Type	Container	Solid	1AC	IAG	1AG				192	1AL		IAL	1AG-		13658	يد	211
Project Conta			٠.	1.0		33% NO.			<u>. 1949</u>	Volum	e	Liquid							7		2.2	100		300			P. 102.5
Lionville Labo							05					Solid	250	250	250	74.			<u>C</u>	250		100	120		i i di di		Va.
ac Spec		Del	570	<u> </u>	TAT_		30 da	ys.		Preser	rvatives		-	ORG	ANIC				70	INC	RG	Hey	-8H	WTP		57P.H	
Date Rec'd	5-	22-0	۲_	. Da	ate Due	-	6-21.	-02		ANAL' REQU	YSES ESTED		VOA		10	Herb			Perion.	Metal	S	CHEN.	Dies	TPH GAGO	ine	(
MATRIX									Matrix					·		. ↓		Lionv	ille La	borate	ory Us	se Onl	У	<u>†</u>	V T	T	
CODES: S - Soil SE - Sediment SO - Solid	Lab ID		i	Client	t ID/Desc	ription			QC hosen (✔)	Matrix	Date Collected	Time Collected	062×N	75790	OPCB				ZWORG ()	MCIB		ICRE	00/00	09,60			
SL - Sludge W - Water	1911	BI	11 1	105	7		4. 4.	IVI	5 NIS	15	5-170	1105		7	1	Gy (1			1			1	V	//	/	7	
O - Oil A - Air	<u> </u>	<u> </u>	1_1_	1					1		10 / [0.	1/1/5	1														
DS - Drum Solids				<u> </u>	-				1													1					
DL - Drum Liquids																											18134
L - EP/TCLP Leachate		-	<u> </u>																					day.			
WI - Wipe X - Other				 																							
F - Fish				· · · · ·												Tage Wast											
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							201																				
		1												*											sign of		3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
Special Instruc	tions:	5	AF	Ħ	Вог	050)		DAT	re/REVISI MET	ons: _ 1 R (_ 2 V	RA +		B. (u , /	Ng.	Mn	, Mo	, Ni;	1) Shipp	Llonvoid Signature Llonvoid Sign	/ or	. Ta) Presei	only esistant Se int on Or or	uter
									In	IORG ()	3. <u>ICF</u>	L, ICNO	3, I	cso4,	IVI	13N,	IN3	N2,	ISF ī		OLL) 2) Ambi	ent or G	Spines.	2) P) Unbro 'ackage	oken on or ont on Si	Outer r N ample
				T		^			ngarkaranna 		5 _ 6									- C	Condition () Samp	/ Prese	or N	S	Sample (oken on O or ecord Pre	N
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Fed Ex		He	(3	5/22/07	2 10	00			POSIT		ORIG	- 4024			CO NO	C Reco TES:	ord? Y	or 🔕	ł	lolding	ived W Times	or N	C	Cooler emp. ⊴	0	°C
		•	51		,				AA Y	ASTE		REW	KII	IEN		17	905	20	737	100	90						

Bechtel Hanfo	ord Inc.	C	HAIN OF CUST	ODY/S	AMPI	LE ANALY	SIS	RJ	EQUEST		B02	2-050-27	Page 1	of <u>l</u>
Collector FAHLBERG			nny Contact ACQUES	Telephor 372-90					oject Coordin ENT, SJ	ator P	rice Code	8N	Data Tur	1
Project Designation 216-Z-11 Ditch Borehole Sa	amples	Sampl 200	ing Location W					1	F No. 2-050	A	ir Quality		45 1	Days
Ice Chest No. SEE	EOSPC	1	Logbook No. 1517 • 3		COA B20CW	75674C			ethod of Shipn Fed EX	nent .				
Shipped To			e Property No.	70	201	139		Bi	ll of Lading/A	ir Bill No.	5 EF	05	PC	
POSSIBLE SAMPLE HAZ	CARDS/REMARKS O 314 CA	P15.210	Preservation	Cool 4C	Cool 40	C Cool 4C	Coel	1 4C	Cool 4C	Cool 4C	Cool 4C	None	None	
7127	6 1314CH	K/K 4	Type of Container	aG	aG	P	aC	3	aG	aG	aG	P	aG	
			No. of Container(s)	1	1	1	l		1	1	1	1	1/	
\(\lambda\)	sone		Volume	250mL	120ml		250		250mL	250mL	120mL	1000mL	120mL	
	SAMPLE ANAL	YSIS		See item (1) ir Special Instructions.	1 Chromiu Hex - 71		PCBs	- 8082	See item (3) in Special Instructions.	See item (4) ir Special Instructions.	TPH-Diesel Range - WTPH-D; TPH-Gasoline Range - WTPH-G	See item (5) in Special Instructions.	See item (6) in Special Instructions.	+ie +•
Sample No.	Matrix *	Sample Date	Sample Time									/		
B14KC7	SOIL	5.17.0 3	2 1105	×	*		X		<u> </u>	χ.	<u></u>			BIYLKY
									Per rell Re	rsonnel no inquish sa f # 24	t available to mples from t	he 3728		
CHAIN OF POSSES	SION	Sign/Pri	nt Names	<u> </u>	S	PECIAL INSTR	LUCTI	ONS						Matrix *
Relinquished By/Removed From	Date/Time Date/Time Date/Time Date/Time Date/Time Date/Time Date/Time	Received By/St. Received By/St.	ored In Cored In Core	Date/Time Date/Time Date/Time Date/Time Date/Time	() () () () () () () () () () () () () (See SAF (1) ICP Metals - 60 (CP Metals - 6010A Molybdenum, Nicke (2) IC Anions - 300 (3) VOA - 8260A (** IX Add-On) {Tetrah (4) Semi-VOA - 82 Tributyl phosphate} (5) Gamma Spase Europium 155, Nick Neptunium 237, Nick (6) Isotopic Plutoni (Add-on) {Curum - 150, Nick (Add-on) {Curum - 150, Nic	(Supertical, Vanado, O (Fluor TCL); Vaydrofura 70A (TC Complet Sum 94 ckel-63, um, -on	race Adium, pride, 1 /OA - an) CL); S e (Ce Radium)	Add-On) {Beryllin Zine}; Mercury Nitrate, Sulfate}; 8260A (Add-On) Semi-VOA 8270 SSUM-134, Cesiur Jum-226, Radium- Ritum-82,90 Tol	am, Boron, C - 7470 - (CV Ammonia - ;) {Trichloron 0A (Add-On; n-137, Cobal 228): Isotop al Sf, Techno	opper, Magnesi) 350.3; NO2/NO nonofluorometh) {1,2,4-Trimeth t-60, Europium- ic Thorium {The	um, Manganese 3 - 353.1; Sulfi ane}; VOA - 82 nylbenzene, Cyc 152, Europian torium-232}; C m H3; Isotopi icium-241/Curi	des - 9030 160A (App 160A (App 160A (App 164 164 164 165 165 165 165 165 165 165 165	S=Soil SD=Sediment SO=Solid SI=Sludge W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tirsue WI=Wipe L=Liquid V=Vegetation X=Other
LABORATORY SECTION Received	ea ny	•			Title							I	Date/Time	
FINAL SAMPLE Dispose DISPOSITION	sal Method	44-44-44-44-44-44-44-44-44-44-44-44-44-	Markey, and the first of the second s		····	Disp	osed By		***************************************	**************************************			Date/Time	

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 5-22.02

SAF#/SOW#/Release #: 1302.050

Laboratory SDG #:

0205 6734

NOTE:	ALL ENTRIES MARKED "NO" MUST BE I	EXPLAINED II	N THE COMM	ENT SECTION	Ţ
].	Custody seals on coolers or shipping container intact, signed and dated?	□ Yes	□ N ₀	□ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	□ Y es	□ No	□ N/A	☐ see Comment #
3.	Airbill # recorded?	DX es	□ No	□ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	□ Yes	□ No	□ N/A	☐ see Comment #
5.	Sample containers are intact?	ДYes	□ No	□ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	DYes	□ No	□ N/A	☐ see Comment #
7.	All samples on coc received?	DX es	□ No	□ N/A	see Comment #
8.	All sample label information matches coc?	Ø Yes	□ No	□ N/A	□ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	D.Yes	□ No	□ N/A	🗆 see Comment#
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	DYes .	□ No	□ N/A	□ see Comment #
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	DANIA	see Comment #
12.	coc signed and dated?	Dies	□ No	□ N/A	☐ see Comment #
13.	coc faxed or emailed to client?	□ Yes	□ No	□ N/A	□ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	☐ see Comment #

Cooler # / temp and Comments:

02.0004 22

Laboratory Sample Custodian:

Laboratory Project Manager:

Will Neenand

Lionville Laboratory, Inc. BNA ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1788

RFW LOT # :0205L734

CLIENT ID	RFW #	MTX	PREP #	COLLECTN	DATE REC	EXT/PREP	ANALYSIS
B14KC7	001	S			05/22/02		
B14KC7	001 MS	S	02LE0581	05/17/02	05/22/02	05/24/02	05/31/02
B14KC7	001 MSD	S	02LE0581	05/17/02	05/22/02	05/24/02	05/31/02
LAB QC:							
SBLKVM SBLKVM	MB1 MB1 BS	S S	02LE0581 02LE0581	N/A A/N	N/A A\N	05/24/02 05/24/02	06/03/02 06/03/02





Client: TNU-HANFORD B02-050

LVL #: 0205L734

SDG/SAF #: H1788/B02-050

W.O. #: 11343-606-001-9999-00

Date Received: 05-22-2002

SEMIVOLATILE

One (1) soil sample was collected on 05-17-2002.

The sample and its associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 05-24-2002 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 05-31-2002 and 06-03-2002.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 2. The sample was extracted and analyzed within required holding time.
- 3. Non-target compounds were detected in the sample.
- 4. All surrogate recoveries were within EPA QC limits.
- 5. All matrix spike recoveries were within EPA QC limits.
- 6. All blank spike recoveries were within EPA QC limits.
- 7. The method blank contained the common laboratory contaminant Bis (2-Ethylhexyl) phthalate at a level less than the CRQL.
- 8. Internal standard area criteria were not met for samples B14KC7 MSD, 02LE0581-MB1 and 02LE0581-MB1 BS; however, the GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly; all surrogate and spike recoveries were within QC limits; consequently, the sample was not reanalyzed.
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

J. Michael Taylor

06-10-02 Date

President

Lionville Laboratory Incorporated

D WUM

som\gorup\data\bna\tnu-hanford-0205-734.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 1 2 pages.

GLOSSARY OF BNA DATA

DATA QUALIFIERS

- U = Compound was analyzed for but not detected. The associated numerical value is the estimated sample quantitation limit which is included and corrected for dilution and percent moisture.
- J = Indicates an estimated value. This flag is used under the following circumstances: 1) when estimating a concentration for tentatively identified compounds (TICs) where a 1:1 response is assumed; or 2) when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the specified detection limit but greater than zero. For example, if the limit of detection is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination. This flag is also used for a TIC as well as for a positively identified TCL compound.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- D = Identifies all compounds identified in an analysis at a secondary dilution factor.
- I = Interference.
- NO = Result qualitatively confirmed but not able to quantify.
- A = Indicates that a TIC is a suspected aldol-condensation product.
- N = Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.
- X = This flag is used for a TIC compound which is quantified relative to a response factor generated from a daily calibration standard (rather than quantified relative to the closest internal standard).
- Y = Additional qualifiers used as required are explained in the case narrative.

mmz\10-94\gloss.bna

GLOSSARY OF BNA DATA

ABBREVIATIONS

BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spike solutions and carried through all the steps in the method. Spike recoveries are reported.

BSD = Indicates blank spike duplicate.

MS = Indicates matrix spike.

MSD = Indicates matrix spike duplicate.

DL = Suffix added to sample number to indicate that results are from a diluted analysis.

NA = Not Applicable.

DF = Dilution Factor.

NR = Not Required.

SP, Z = Indicates Spiked Compound.

mmz\10-94\gloss.bna

TECHNICAL FLAGS FOR MANUAL INTEGRATION

Manual quan modifications or integrations are performed routinely to improve the data quality for a variety of technical reasons. Documentation of these modifications should be clear and concise. The following "flags" are used to indicate the technical reasons for quan modifications:

- MP Missed Peak: manually added peak not found by automatic quan program.
- PA Peak Assignment: quan report was changed to reflect correct peak assignment.
- RI Routine Integration: routine integrations are performed for some analytes that are consistently integrated improperly by the automatic integration programs. Examples are the dichlorobenzene isomers on the VOA packed column and benzo(b)fluoranthene/benzo(k)fluoranthene which are poorly resolved on the BNA column.
- SP Split Peak: the automatic integration improperly split the peak; a manual integration was performed to get the correct area.
- CB Coelution/Background: peak was manually integrated to eliminate contribution from coeluting compounds, background signal, or other interference.
- Proper Integration: a peak with poor or inconsistent integration (e.g., excessive tail) was properly integrated manually.

RFW 21-21-035/A-08/93

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, Special List

Report Date: 06/07/02 11:01 Client: TNUHANFORD B02-050 H1788 Work Order: 11343606001 RFW Batch Number: 0205L734

	Cust ID:	B14KC7	B14KC7		B14KC7		SBLKVM		SBLKVM BS			
Sample	RFW#:	001	001 MS		001 MSD)	02LE0581-M	в1	02LE0581-ME	31		
Information	Matrix:	SOIL	SOIL		SOIL		SOIL		SOIL			
	D.F.:	1.00	1.0		1.0		1.0	-	1.00			
	Units:	ug/Kg	ug/K	g	ug/K	g	ug/K	g	ug/Kg	H		
	Nitrobenzene-d5	75 %	82	%	. 85	%	84	%	76	%	***************************************	-
Surrogate	2-Fluorobiphenyl	77 %	88	%	85	%	86	%	79	%		
Recovery	p-Terphenyl-d14	117 %	107	%	114	%	106	%	98	%		
	Phenol-d5	78 %	85	%	81	%	82	%	80	%		
	2-Fluorophenol	76 %	82	%	79	%	79	%	77	%		
	2,4,6-Tribromophenol	94 %	91	%	90	%	81	%	82	%		
											=======	===fl
Phenol		370 U	86	%	82	%	330	U	80	%		
	ethyl)ether	370 U	370		370	U	330	U		U		
2-Chloropheno	ol	370 U	87	%	86	%	330	U	82	96		
1,3-Dichlorob	oenzene	370 U	370	U	370	U	330	U		U		
1,4-Dichlorok	penzene	370 U	66	%	67	%	330	Ü	68	060		
	oenzene		370	Ü	370	U	330	U		U		
2-Methylpheno		370 U	370	U	370	U	330	U		U		
2,2'-oxybis(1	1-Chloropropane)	370 U	370	U	370	U	330	U		U		
3- and/or $4-$ M	Methylphenol	370 U	370	U	370	U	330	U		U		
N-Nitroso-Di-	-n-propylamine	370 U	79	%	75	90	330	U	84	%		
Hexachloroeth	hane	370 U	370	U	370	U	330	U	330	U		
		370 U	370	U	370	U	330	U	330	U		
Isophorone	William Committee of the Committee of th	370 U	370	U	370	Ū	330	U	330	U		
2-Nitrophenol	1	370 U	370	Ü	370	U	330	U	330	U		
2,4-Dimethylp	phenol	370 U	370	U	370	U	330	U	330	U		
bis (2-Chloro	ethoxy) methane	370 U	370	U	370	U	330	U	330	U		
2,4-Dichlorop	phenol	370 U	370	U	370	U	330	Ū	330	U		
	orobenzene	370 U	75	%	73	ૄ	330	U	71	%		
Naphthalene_		370 U	370	U	370	U	330	U	330	U		
4-Chloroanil:	ine	370 U	370	U	370	U	330	U	330	U		
Hexachlorobut	tadiene	370 U	370	U	370	U	330	U	330	U		
4-Chloro-3-me	ethylphenol	370 U	87	%	89	%	330	U	82	%		
2-Methylnapht	thalene	370 U	370	U	370	U	330	U	330	U		
Hexachlorocy	clopentadiene	370 U	370	U	370	U	330	U	330	U		
2,4,6-Trichlo	orophenol	370 U	370	U	370	U	330	Ų	330	U		
2,4,5-Trichlo	orophenol	920 U	920	U	920	U	830	U	830	U		
	C											

^{*=} Outside of EPA CLP QC limits.



Cust ID: B14KC7 B14KC7 B14KC7 SBLKVM SBLKVM BS RFW#: 001 001 MS 001 MSD 02LE0581-MB1 02LE0581-MB1 2-Chloronaphthalene_____ 370 U 370 U 370 IJ 330 U 330 U 2-Nitroaniline_____ 920 U 920 IJ 920 IJ 830 U 830 U Dimethylphthalate_____ 370 U 370 [] 370 U 330 U 330 U Acenaphthylene_____ 370 U 370 U 370 TI 330 U 330 U 2,6-Dinitrotoluene 370 U 370 U 370 U 330 U 330 U 830 U 3-Nitroaniline_____ 920 U 920 IJ 920 II 830 U Acenaphthene_____ 370 U 79 % 79 왕 330 U 76 ò 2,4-Dinitrophenol_____ 920 U 920 IJ 920 U 830 U 830 U 4-Nitrophenol 830 U 920 U 72 % 45 왕 79 % Dibenzofuran 370 U 370 IJ 370 U 330 U 330 U 2,4-Dinitrotoluene____ 370 U 80 ્ટ 75 ۶ ک 330 11 76 ્ટ Diethylphthalate_____ 370 U 370 TI 370 II 330 II 330 II 4-Chlorophenyl-phenylether 370 370 U 330 U 330 U 370 U U Fluorene_____ 370 U 330 U 370 U 370 IJ 330 U 920 U 920 ·U 920 U 830 U 830 U 920 U 920 U 920 U 830 U 830 U N-Nitrosodiphenylamine (1)_____ 370 U 370 U 370 U 330 U 330 II 4-Bromophenyl-phenylether____ 370 U 370 U 370 U 330 U 330 U Hexachlorobenzene 370 U 370 IJ 370 U 330 U 330 U Pentachlorophenol 89 920 U 95 ે 830 U 87 ્ટ્ર Phenanthrene_____ 370 U 370 U 370 U 330 U 330 U Anthracene 370 U 370 IJ 370 U 330 U 330 U Carbazole 370 U 370 370 U 330 U U 330 II Di-n-Butylphthalate_____ 370 U 370 IJ 370 U 330 U 330 U Fluoranthene____ 370 U 370 U 370 U 330 U 330 U Pyrene ____ 370 U 108 % 112 કૃ 330 U 96 왕 Butylbenzylphthalate 370 U 370 U 370 U 330 U 330 U 3,3'-Dichlorobenzidine 370 U 370 U 370 U 330 U 330 IJ Benzo(a) anthracene_____ 370 U 370 II 370 U 330 U 330 U Chrysene 370 U 370 IJ 370 TT 330 U 330 U bis(2-Ethylhexyl)phthalate 59 JB 51 JB 52 36 J JΒ 41 JB Di-n-Octyl phthalate_____ 370 II 370 II 370 U 330 U 330 U Benzo(b) fluoranthene____ 370 U 370 370 U IJ 330 U 330 U Benzo(k)fluoranthene 370 U 370 U 370 H 330 II 330 IJ Benzo(a)pyrene_____ 370 370 U IJ 370 II 330 U 330 IJ Indeno(1,2,3-cd)pyrene 370 U 370 U 370 U 330 U 330 U Dibenzo(a,h)anthracene____ 370 U 370 U 370 U 330 II 330 U Benzo(g,h,i)perylene____ 370 U 370 U 370 U 330 U 330 IJ Tributylphosphate_____ 370 U 370 U 370 U 330 U 330 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP OC limits.

CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

B14KC7		

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B02-050 H1788

Matrix: (soil/water) <u>SOIL</u>

Lab Sample ID: <u>0205L734-001</u>

Sample wt/vol: 30.0 (g/mL) \underline{G} Lab File ID: $\underline{A053107}$

Level: (low/med) LOW

Date Received: 05/22/02

% Moisture: $\underline{10}$ decanted: (Y/N)

Date Extracted: 05/24/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 05/31/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: ___7.0

CONCENTRATION UNITS:

Number TICs found: 3

(ug/L or ug/Kg) ug/Kg

		Transition of the state of the		
CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
		======	=========	=====
1.	ALDOL CONDENSATE	7.607	200	JAB
2.	ALDOL CONDENSATE	8.321	2000	JAB
3.	ALDOL CONDENSATE	9.641	200	JAB

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET TENTATIVELY IDENTIFIED COMPOUNDS

	CLIENT	SAMPLE	NO.	
, -				
				ļ
1 5	SBLKVM			

Lab Name: Lionville Labs, Inc. Work Order: 11343606001

Client: TNUHANFORD B02-050 H1788

Matrix: (soil/water) SOIL

Lab Sample ID: 02LE0581-MB1

Sample wt/vol: 30.0 (g/mL) \underline{G} Lab File ID: $\underline{A060308}$

Level: (low/med) <u>LOW</u>

Date Received: 05/24/02

% Moisture: ____ decanted: (Y/N)_ Date Extracted: 05/24/02

Concentrated Extract Volume: 1000(uL) Date Analyzed: 06/03/02

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) <u>N</u> pH: <u>7.0</u>

CONCENTRATION UNITS:

Number TICs found: 3

(ug/L or ug/Kg) ug/Kg

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
		======	_==========	=====
1.	ALDOL CONDENSATE	7.478	100	JA
2.	ALDOL CONDENSATE	8.194	1000	JA
3.	ALDOL CONDENSATE	9.525	100	JA

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nville Laborat	ory Us	e Only Cu	stody	/ Tra	ns.	fer	R	eco	rd/La	ab V	No.	rk as	Re	qu	est	Pag	ge				Ü		V	ORALORA	lbst.
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SO - Solid SL - Sludge						MS	MSD	5	5-1707	1174	20 000	7	1	16762	- Daries			1		1	F			/	320 S
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F. DE	+	1-11 0	5/22/02	1000				PO\$11		OR	GIN	IAL		\Box		cord? \		8	Holdin	a Time		J	Cooler Temp.		°C
per cof		Herry	harlow	1			W	STE		REV	VRI	TE	N	JĽ	790	52	93	7/0	90						

Company Contact Talephone No. TRENT, SI Price Use SIV Air Quality Procedure Supplies Sampling Location 2002 216-2-11 Dieth Borthole Samples Context No. Field Loghook No. El 1517-3 Context No. Field Loghook No. El 1517-3 Context No. Offsite Property No. Preservation Context No. Free Context No. Preservation Context No. Type of Container(a) Volume Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(a) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(b) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(a) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(b) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(b) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume See Sam (1) Fr. Special Handling and/or Storage No. of Container(c) Volume	<u>l</u> of <u>l</u>					
ollector Directors Directors Sampling Location Sampling Location Sounding Location BB20CW3674C Method of Shipment Fed EX Bill of Lading Air Bill No. 5 Cod 4C	Turnaround					
Sample No. Sample Analysis Sample No. Sample No. Sample No. Sample Date Sample Time Sample No. Sample No. Sample Date Sample Time Sample No. Sample No. Matrix* Sample Date Sample Date Sample No. Matrix* Sample Date Sample No. Personal not available to refinquish samples from the 1718 Ref* Ref* Personal not available to refinquish samples from the 1718 Ref* CHAIN OF POSSESSION Sign/Print Names See Safe Order No. CHAIN OF POSSESSION Sign/Print Names	5 Days					
Field Logbook No. EL.1317-3 B20CW3574C Fed EX						
EL15173 BILL of Lading/Air Bill No. Offsite Property No. Offs						
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Personnel not available to relinquish samples from the 3728 Ref # 24 on 5 /21/02 CHAIN OF POSSESSION Sign/Print Names Relinquished By/Removed From Relinquished By/Removed From Date/Time 110 5 Received By/Stored In Date/Time 110 5 Date/Time 110 5 Received By/Stored In Date/Time 110 5 Date/Time 110 5 Date/Time 110 5 Received By/Stored In Date/Time 110 5 Date/Time 110 5 Date/Time 110 5 Received By/Stored In Date/Time 110 5 Date						
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Relinquished By/Removed From Relinquished By/Removed From Date/Time Date/T	Matrix *					
Received By/Stored In Date/Time Date/Tim	S=Soil					
CP Metals - 6010.A (Supertrace Add-On) Beryllium, Boron, Copper, Magnessium, Manganese, Molybdenum, Nickel, Vanademy, Zincy, Mercury - 7470 - (CV) Molybdenum, Nickel, Vanademy, Zincy, Molybdenum, Zincy,	SE=Sediment SO=Solid					
Carlons - 300.0 (Fluidde, Nittale, Strate, Strate, Strate)	W = Water					
Relipentished By/Removed From Date/Time Received By/Stored In Parametric Stributyl phosphate) Received By/Stored In Parametric Stributyl phosphate)	030					
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15-72-1/3 100 Security 5-22-02 (CCV) (S) Gamma Space Complete (Cessum-134, Cessum-134, Ces	, ·					
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Relinquished By/Removed From Date/Time Received By/Stored In Date/Time (Add-on) (Curium 243)						
Title Date:						
LABORATORY Received By Date SECTION Date Section Secti	Time					
FINAL SAMPLE Disposal Method DISPOSITION Disposal Method						

SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 5-22.02

SAF# / SOW# / Release #: 1302 . 050

Laboratory SDG #:

02056734

1000	ALL ENTRIES MARKED "NO" MUST BE I	EXPLAINED IN	THE COMMI	ENT SECTION	
1.	Custody seals on coolers or shipping container intact, signed and dated?	D√Yes	□ No	□ N/A	□ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	₽ X es	□ No	□ N/A	☐ see Comment #
3.	Airbill # recorded?	□ × es	□ No	□ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	DXes .	□ No	□ N/A	see Comment#
5.	Sample containers are intact?	₽ Yes	□ No	□ N/A	□ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	D Xes	□ No	□ N/A	See Comment #
7.	All samples on coc received?	DX es	□ No	□ N/A	□ see Comment #
8.	All sample label information matches coc?	⊠Yes	□ No	□ N/A	□ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	₽Yes	□ No	□ N/A	☐ see Comment #
10	Policy? (identify all bottles not within policy. See reverse side for policy)	DYes .	□ No	□ N/A	□ see Comment #
11	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	□	□ see Comment
12	2. coc signed and dated?	Dres	□ No	□ N/A	☐ see Comment
13	3. coc faxed or emailed to client?	□ Yes	□ No	□ N/A	☐ see Comment
3	 Project Manager/Client contacted concerning discrepancies? (name/date) 	□ Yes	□ No	A/A	☐ see Comment

Cooler #	temp	and	Comr	nents:

,02-0004 23

Laboratory Sample Custodian:

Laboratory Project Manager:

Lionville Laboratory, Inc. PCB ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
was a second of the second of						
B14KC7	001	S	02LE0580	05/17/02	05/23/02	06/01/02
B14KC7	001 MS	S	02LE0580	05/17/02	05/23/02	06/01/02
B14KC7	001 MSD	S	02LE0580	05/17/02	05/23/02	06/01/02
LAB QC:						

PBLKQE	MBl	S	02LE0580	N/A	05/23/02	06/01/02
PBLKQE	MB1 BS	S	02LE0580	N/A	05/23/02	06/01/02

Affre / who





Analytical Report

Client: TNU-HANFORD B02-050

W.O. #: 11343-606-001-9999-00

LVL#: 0205L734

Date Received: 05-22-02

SDG/SAF#: H1788/B02-050

PCB

One (1) soil sample was collected on 05-17-02.

The sample and its associated QC samples were extracted on 05-23-02 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 06-01-02. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.
- 2. All required holding times for extraction and analysis have been met.
- 3. The sample and its associated QC samples received a sulfuric acid cleanup.
- 4. The method blank was below the reporting limits for all target compounds.
- 5. All surrogate recoveries were within acceptance criteria.
- 6. All blank spike recoveries were within acceptance criteria.
- 7. All matrix spike recoveries were within acceptance criteria.
- 8. All initial calibrations associated with this data set were within acceptance criteria.
- 9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

pef\r:\group\data\pest\tnu hanford\05L-734.pcb

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of

the analytical data. Therefore, this report should only be reproduced in its entirety of

Lionville Laboratory Incorporated

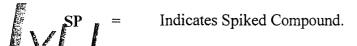
GLOSSARY OF PESTICIDE/PCB DATA

DATA QUALIFIERS

- TI Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- This flag is used when the analyte is found in the associated blank as well as in the В sample. It indicates possible/probable blank contamination.
- Indicates that the compound was detected beyond the calibration range and was \mathbf{E} subsequently analyzed at a dilution.
- Interference. I

ABBREVIATIONS

- Indicates blank spike in which reagent grade water is spiked with the CLP matrix BS spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- **BSD** Indicates blank spike duplicate.
- MS Indicates matrix spike.
- MSD =Indicates matrix spike duplicate.
- Indicates that recoveries were not obtained because the extract had to be diluted for DLanalysis.
- Not Applicable. NA
- DF Dilution Factor.
- Not Required. NR



Lionville Laboratory Incorporated

GLOSSARY OF PESTICIDE/PCB DATA

- P = This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported on Form I and flagged with a "P".
- **D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C = This flag applies to a compound that has been confirmed by GC/MS.



L-WI-035/A-04/01

PCBs by GC

Report Date: 06/11/02 14:44, Client: TNUHANFORD B02-050 H1788 Work Order: 11343606001 Page: 1 RFW Batch Number: 0205L734

	Cust ID:	B14KC7		B14KC7		B14KC7	•	PBLKQE		PBLKQE BS		
Sample	RFW#:	001		001 MS		001 MSD)	02LE0580-MI	31	02LE0580-M	в1	
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		
	D.F.:	1.0	0	1.0	0	1.0	0 (1.00	C	1.0	0	
	Units:	UG/K	G	UG/K	G	UG/K	Œ	UG/K	3	UG/K	:G	
Surrogate:	Tetrachloro-m-xylene	80	%	80	96	100	%	90	%	110	%	100 Maria (100 Maria (
	Decachlorobiphenyl	105	%	100	00	115	%	105	%	120	%	
==========			=fl=	========	=f1=		=f1		=f1		=fl=	======================================
Aroclor-1016		37	U	74	96	86	%	33	U	90	양	
Aroclor-1221		74	Ū.	74	U	74	U	67	U	67	U	
Aroclor-1232		37	U	37	U	37	U	33	U	33	U	
Aroclor-1242		37	U	37	U	37	U	33	U	33	U	
Aroclor-1248	}	37	U	37	U	37	U	33	U	33	U -	
Aroclor-1254		37	U	37	U	37	U	33	U	33	U	
Aroclor-1260)	37	U	82	96	93	%	33	U	96	%	
•												

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville	Laboratory	Use	Only

Custody Transfer Record/Lab Work Request Page 1 of 1

F	G		V	ABORNIO)	RS INC.	9
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	ing. No. 15. A		Vilva	*	Journal of the Control of the Contro	
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UDVU		7

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS Client HANFORD SAF# 1802-050 Refrigerator # Liquid Est. Final Proj. Sampling Date ____ #/Type Container Project # 1(343 - 606 - 001-9999 -00 Solid Project Contact/Phone # _ Volume 250 250 250 Solid 05 Lionville Laboratory Project Manager _ 30 days OC SPEC Del STD TAT Preservatives **ORGANIC** ANALYSES REQUESTED 5-22-02 6-21-02 Date Due Date Rec'd Lionville Laboratory Use Only Matrix MATRIX 9 CODES: 062×N 0625× 09/50 Time ODPA Date Chosen Lab Matrix Client ID/Description 3 S - Soil Collected Collected SE - Sediment SO - Solid MS MSD SL - Sludge W - Water 5-1702 1105 O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish DATE/REVISIONS: Lionville Laboratory Use Only 5AF # BOZ-050 RCRA + Be, B. Cu, Mg, Mn, Mo, Ni; Special Instructions: Samples were:/ Tamper Resistant Seal was: 1) Shipped / or 1) Present on Outer Hand Delivered Package (V) or N INORGO 3 ICFL, ICNO3, ICSO4, INHON, INON2 ISFD Airbill # ____ 2) Unbroken on Outer Package (Y) or N 2) Ambient or Chilled 3) Present on Sample (f) or N 3) Received in Good Condition or N 4) Unbroken on 4) Samples Sample (Y) or N Properly Preserved **COC Record Present** Relinquished Received Ø or N Relinquished Received Discrepancies Between Upon Sample Rec't Date Time Date Time Samples Labels and 5) Received Within (r) or N COC Record? Y or N Holding Times COMPOSITE 000 NOTES:

Bechtel Hanford	Inc.	C	HAIN OF CUST	ODY/S	AMP	LE	ANALY	SIS	R	EQUEST		B02	2-050-27	Page <u>l</u>	of <u>l</u>	
Collector FAHLBERG		Comp	any Contact ACQUES	Telepho 372-9	ne No.				Pı	roject Coordin RENT, SJ	ator	Price Code	8N	Data Tur	17	
Project Designation 216-Z-11 Ditch Borehole Sampl	es		ing Location							AF No. 02-050	A	ir Quality		45 I	Days 1	
Ice Chest No. SEE	OSPC		Logbook No. 1517 • 3		COA B20C		4C		Method of Shipment Fed EX							
Shipped To TMA(RECRA)		1	e Property No.	70	ZO	13	9		В	Bill of Lading/A	ir Bill No	5EF	FOSPC			
POSSIBLE SAMPLE HAZAR	DS/REMARKS	PK.Z10	2			•										
POSSIBLE SAMPLE HAZARI T (C TO Special Handling and/or St	314 LK	esk 4	Preservation	Cool 4C	Cool		Coel 4C	Cool		Cool 4C	Cool 4C	Cool 4C	None	None		
Special Handling and/or St	torage	17 ' '	Type of Container	aG	aG	3	Р	aC	G —	aG	aG	aG	P	aG/		
, 0	_		No. of Container(s)	1	1		1	1	!	1	1	1	1	1/		
\sim	Wone		Volume	250mL	120r	mL	1000mL	250r	mL	250mL	250mL	120mL	1000mL	120mL		
	YSIS		See item (1) is Special Instructions.	Hex -		See item (2) in Special Instructions.	PCBs -	- 808	See item (3) in Special Instructions.	See item (4) i Special Instructions	Range -	See item (5) in Special Instructions.	See ifem (6) in Special Instructions.	+ie +.		
Sample No.	Matrix *	Sample Date	Sample Time										/			
B14KC7	SOIL	5.17.0	2 1105	×	\ \x		オ	ኢ		Х	አ	Α.			BIYLK4	
					-						- 		121			
		Annual Control Mills			-					Per	rsonnel no inquish sa	t available to mples from t				
										Re	r# <u>20</u>	on 5/2	LOZ -			
CHAIN OF POSSESSIO	·		nt Names				IAL INSTR	UCTI	ON	S		A			Matrix *	
Relinquished By/Removed From	Date/Time DE 37-78 5.21	Ref 3	ored In Core ored In Cored In	ate/Time	\$0 \$0 \$0	ICP M Molyb (2) IC (3) V IX Ad (4) So Tribut (5) G Europ Neput	CP Metals - 601 detals - 6010.4 (a c Anions - 300.1 OA - 8260.4 (T dd-On) (Tetrahy emi-VOA - 827 tyl phosphate) amma Speerer jum 155, Nich mium 237, Nich	(Supertr , Vanad 0 (Fluor CL); Ve ydrofura 0A (TC omplete ium 94,	race dium pride, OA an} CL);	race) {Arsenic, Bar Add-On) {Beryllin a, Zinc}; Mercury b, Nitrate, Sulfate}; 8260A (Add-On) Semi-VOA 8270 cestum-134, Cestur dium-226, Radium- mitium-89,90 Tol	am, Boron, C - 7470 - (CV Ammonia -) {Trichloror 0A (Add-On n-137, Coba - 228} - Isotol at Sr, Techn	Copper, Magnesi (1) 350.3; NO2/NO nonofluorometha (1) {1,2,4-Trimeth (1:-60, Europium- pic Thorium {The tetium-99, Trime	um, Manganeson 3 - 353.1; Sulfi ane}; VOA - 87 ylbenzene, Cyo 152, Europium orium-232}; C	des - 9030 600A (App clohexanone,	S=Soil SE=Sediment SO=Solid SI=Sludge W = Water O=Oil A=AAir DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From	Date/Time	Received By/St	ored In I	Date/Time		-(6) is		m, Am		ium 241/Curium 2			cium-241/Curi			
LABORATORY Received By SECTION	/				Title									Date/Time		
FINAL SAMPLE Disposal M DISPOSITION	ethod						Dispo	sed By						Date/Time		

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT:

HANFORD

Purchase Order/Project:

DATE: 5-22.02

SAF# / SOW# / Release #: 1302.05	0
----------------------------------	---

Laboratory SDG #:

02056734

	ALL ENTRIES MARKED "NO" MUST BE E	D Yes	□ No	□ N/A	
1.	Custody seals on coolers or shipping container intact, signed and dated?	de l'es	2 140	UWA	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	Ų X es	[°] □ No	□ N/A	□ see Comment #
3.	Airbill # recorded?	D Yes	□ No	□ N/A	□ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic	DXes .	□ No	□ N/A	see Comment #
	bag and taped to inside lid)		•		
5.	Sample containers are intact?	₽ Yes	□ No	□ N/A	□ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	□Xes	□ No	□ N/A	□ see Comment #
7.	All samples on coc received?	DX es	□ No	□ N/A	See Comment
8.	All sample label information matches coc?	⊠√Yes	□ No	□ N/A	□ see Comment
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	DYes	□ No	□ N/A	☐ see Comment
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	DYes .	□ No	□ N/A	□ see Comment
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	DANIA	D see Comment
12.	coc signed and dated?	D/Yes	□ No	□ N/A	☐ see Comment
13.	coc faxed or emailed to client?	□ Yes	□ No	D N/A	🗆 see Comment
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	□ see Commen

Cooler # / temp and Comments:

.02.0004 22

Laboratory Sample Custodian:

Laboratory Project Manager:

Will Neemand



Lionville Laboratory, Inc. GRO ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
	***************************************				***	
B14KC7	001	S	02LVJ531	05/17/02	N/A	05/31/02
B14KC7	001 MS	S	02LVJ531	05/17/02	N/A	05/31/02
B14KC7	001 MSD	S	02LVJ531	05/17/02	N/A	05/31/02
LAB QC:						
La del						
TBLKEQ	MB1	S	02LVJ531	N/A	N/A	05/31/02
TBLKEQ	MB1 BS	S	02LVJ531	A\N	N/A	05/31/02

Agril 5/or





Analytical Report

Client: TNU HANFORD B02-050

LVL#: 0205L734

SDG/SAF#: H01788/B02-050

W.O. #: 11343-606-001-9999-00

Date Received: 05-22-02

GRO

One (1) soil sample was collected on 05-17-02.

The sample and its associated QC samples were analyzed according to Lionville Laboratory OPs based on SW-846 method 8015 for Gasoline range organics (GRO) on 05-31-02. The analysis met the intent of method WTPH-G.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- 1. All results presented in this report are derived from samples that met LVLI's sample acceptance policy.
- 2. All required holding times for extraction and analysis have been met.
- 3. The method blank was below the reporting limits for all target compounds.
- 4. One (1) of five (5) surrogate recoveries was outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
- 5. The blank spike recovery was within acceptance criteria.
- 6. All matrix spike recoveries were outside acceptance criteria. A copy of the SDR has been enclosed.
- 7. All initial calibrations associated with this data set were within acceptance criteria.
- 8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels (Laboratory Manager

Lionville Laboratory Incorporated

pef\r\group\data\gro\05-734.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

Lionville Laboratory Sample Discrepancy Report (SDR) SDR #: 0266162.

Initiator:	John Lych.	Batch: <u>0205 L 734</u>	Parameter: O & RD
Date:	614102	Samples: ms, msD	Matrix: <u>Soli</u>
Client:	オカン	Method: sw846/MCAWW/CLP/	Prep Batch: <u>012 275 531</u>
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	- f CDB		
1. Reason		e Error Client Request	Sampler Error on C-O-C
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		ontainer Broken Wron	ng Sample Pulled Label ID's Illegible
IVIISSI	ing Sample/Extract Co	sufficient Sample Press	ervation Wrong Received Past Hold
Hola	Time Exceeded Insoper Bottle Type No	t Amenable to Analysis	Nooswed / detricit
impro	oper Bottle Type No	Ameriable to Analysis	
i	rified by [Log-In] or [Prep Group] (cir		
c. Proble	em (Include all relevant speci	fic results; attach data if necessary)	
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MSD S	orrollege pelan effect in		
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- Disa	agree with Proposed Action; S	See Instruction	·
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Date	e/Person		
Add			
Can	ncel		
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5. Fillal A	fied re-[log][leach][extract][dig		•
Inclu	ided in Case Narrative	,,,,,,,,,	
Hard	Copy COC Revised		
Elec	tronic COC Revised		
EDD	Corrections Completed		
When Fir	nal Action has been record	ed, forward original to QA Special	ist for distribution and filing.
			stribution of Completed SDR
	Distribution of <u>Completed</u> SDF		Metals: Beegle
	X Initiator		Inorganic: Perrone
	X Lab General Manager: M. X Project Mgr: Stone/Johnson		GC/LC: Kiger
	X Technical Mgr: Wesson/Da		MS: Rychlak/Layman
	$\frac{\lambda}{X}$ QA (file): Alberts		Log-in: Melnic
	Data Management: Feldma	an	Admin: Soos
	Sample Prep: Beegle/Kige		Other:
	, , ,		



GLOSSARY OF GASOLINE RANGE ORGANICS DATA

DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- **BSD** = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- **DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- **DF** = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



GLOSSARY OF GASOLINE RANGE ORGANICS DATA

- **D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C = This flag applies to a compound that has been confirmed by GC/MS.

R:/SHARE/GCVOLATILE/GCVOLATILEGLOS.DOC

GAS RANGE ORGANICS

RFW Batch Number: 0205L734 Client: TNUHANFORD B02-050 H1788 Work Order: 11343606001 Page: 1 Cust ID: B14KC7 B14KC7 B14KC7 TBLKEO TBLKEO BS Sample RFW#: 001 001 MS 001 MSD 02LVJ531-MB1 02LVJ531-MB1 Information Matrix: SOIL SOIL SOIL SOIL SOIL D.F.: 1.00 1.00 1.00 1.00 1.00 Units: UG/KG UG/KG UG/KG UG/KG UG/KG 2,5-Dibromotoluene 67 % 63 45 * % % % 74 67 Gasoline Range Organics (GRO) 33- U 36 * % 34 * % 30 U 55

Brussen

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Report Date: 06/05/02 10:24 9

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L - EP/TCLP Leachate																							
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Relinquished By/Removed From	Date/Time	Received B	y/Stored	in	Date/Time		(Ad	d-on) (Cucium i						RTE	5. 21.0 Date/Time	4
LABORATORY SECTION Receive SECTION FINAL SAMPLE DISPOSITION	al Method	•			······································	Title	-	Disp	oosed B	iy					Date/Time	

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 5-22.02

SAF# / SOW# / Release #: 302.050

Laboratory SDG #:

02056734

TE:	ALL ENTRIES MARKED "NO" MUST BE E	EXPLAINED IN	THE COMM.	ENI SECTION	
1.	Custody seals on coolers or shipping container intact, signed and dated?	D√Yes	□ No	□ N/A	see Comment
2.	Outside of coolers or shipping containers are free from damage?	Q X es	□ No	□ N/A	see Comment
3.	Airbill # recorded?	T Yes	□ No	□ N/A	□ see Comment
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	DYes .	□ No	□ N/A	□ see Comment
		/-			
5.	Sample containers are intact?	Д∕Yes	□ No	□ N/A	□ see Commen
6.	Custody seals on sample containers intact, signed and dated?	D.Xes	□ No	□ N/A	☐ see Commen
7.	All samples on coc received?	DX es	□ No	□ N/A	☐ see Commer
8.	All sample label information matches coc?	⊠Yes	□ No	□ N/A	□ see Commer
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	₽Yes	□ No	□ N/A	□ see Commer
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	DYes .	□ No	□ N/A	□ see Comme
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	DANIA	☐ see Comme
12.	coc signed and dated?	□× es	□ No	□ N/A	□ see Comme
13.	. coc faxed or emailed to client?	□ Yes	□ No	□ N/A	□ see Comme
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	□ see Comm

Cooler # / temp and Comments:

02-0004 22

Laboratory Sample Custodian:

Laboratory Project Manager:

9

Lionville Laboratory, Inc.

DRO ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-050 H 1780

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
						
B14KC7	001	S	02LE0588	05/17/02	05/24/02	06/03/02
B14KC7	001 MS	S	02LE0588	05/17/02	05/24/02	06/03/02
B14KC7	001 MSD	S	02LE0588	05/17/02	05/24/02	06/03/02
LAB QC:						
BLK	MB1	S	02LE0588	N/A	05/24/02	06/03/02
BLK	MB1 BS	S	02LE0588	N/A	05/24/02	06/03/02

Jan 114/n





Analytical Report

Client: TNU-HANFORD B02-050

LVL#: 0205L734

SDG/SAF #: H1788/B02-050

W.O. #: 11343-606-001-9999-00

Date Received: 05-22-02

DIESEL RANGE ORGANICS

One (1) soil sample was collected on 05-17-02.

The sample and its associated QC samples were prepared on 05-24-02 and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 06-03-02. The analysis met the intent of method WTPH-D.

- 1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 2. All required holding times for extraction and analysis have been met.
- 3. The method blank was below the reporting limits for all target compounds.
- 4. All surrogate recoveries were within acceptance criteria.
- 5. The blank spike recovery was within acceptance criteria.
- 6. All matrix spike recoveries were within acceptance criteria.
- 7. All initial calibrations associated with this data set were within acceptance criteria.
- 8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
- 9. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

pef\r:\troup\data\dro\05L-710.doc

Date

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.



GLOSSARY OF DIESEL RANGE ORGANICS DATA

DATA QUALIFIERS

- U = Indicates that the compound was analyzed for but not detected. The minimum detection limit for the sample (not the method detection limit) is reported with the U (e.g., 10U).
- J = Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10 ug/L and a concentration of 3 ug/L is calculated, it is reported as 3J.
- B = This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination.
- E = Indicates that the compound was detected beyond the calibration range and was subsequently analyzed at a dilution.
- I = Interference.

ABBREVIATIONS

- BS = Indicates blank spike in which reagent grade water is spiked with the CLP matrix spiking solutions and carried through all the steps in the method. Spike recoveries are reported.
- **BSD** = Indicates blank spike duplicate.
- MS = Indicates matrix spike.
- MSD = Indicates matrix spike duplicate.
- **DL** = Indicates that recoveries were not obtained because the extract had to be diluted for analysis.
- NA = Not Applicable.
- **DF** = Dilution Factor.
- NR = Not Required.
- SP = Indicates Spiked Compound.



GLOSSARY OF DIESEL RANGE ORGANICS DATA

- **D** = This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- C = This flag applies to a compound that has been confirmed by GC/MS.

DIESEL RANGE ORGANICS BY GC

RFW Batch Number: 0205L734 Client: TNU-HANFORD B02-050 Work Order: 11343606001 Page: 1 Cust ID: B14KC7 B14KC7 B14KC7 BLK BLK BS Sample RFW#: 001 001 MS 001 MSD 02LE0588-MB1 02LE0588-MB1 Information Matrix: SOIL SOIL SOIL SOIL SOIL D.F.: 1.00 1.00 1.00 1.00 1.00 Units: mg/kg mg/kg mg/kg mg/kg mg/kg p-Terphenyl 44 45 49 % 40 % 48 Diesel Range Organics 12.0 U 58 62 % 12.0 U 71 Motor Oil 12.0 U 12.0 U 12.0 U 12.0 U 12.0 U

derist

Report Date: 06/04/02 08:49

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

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Special Instruc	tions:	SAF	# B02-050	· · · · · · · · · · · · · · · · · · ·	DATE	REVISIO	NS:	ΔΛ μ	מ	D (/	1.	M.	Ma	A) ·			Lionv	ille Lab	orator	y Use (Only	
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Relinquished Received Date Time Relinquish				ished	T	6	T		Ŧ		Τ		alas D				v Prese	rved	C	OC Re	cord Pr	resent	
by		by	Date Time	by			by		Date		ime	Sa	crepan mples l	abels	and			or N Upon Sample Rec't Received Within Y or N					
Fed Eso		Hend	5/22/02 1000	C	OMF	OSIT	e5 :# ##	ORIC	i IN/	1			C Rec TES:	ord? Y	or 🐧			Times			Cooler Temp. ≤	2.3	°C
		(/		WA	STE		REW	RIT	IEN		17	905	729	737	100	90	•	J. , **		Jp. 9	• • • •	_ 0

FINAL SAMPLE Disposal Method DISPOSITION	LABORATORY Received By SECTION	Relinquished By/Removed From Date/Time	oved From Date/Time	Religionished By Degmoved From Date Time	Actinguished By/Removed From S. 21.02 El	Remove Ve	Relinquished By/Removed From Date/Time 110	CHAIN OF POSSESSION				B14KC7 SOIL	Sample No.		SAMPLE ANALYSIS		でしていた	Special Handling and/or Storage		POSSIBLE SAMPLE HAZARDS/REMARKS	Shipped To	Tee Chest No. SEE OSP	Project Designation 216-Z-11 Ditch Borehole Samples	Collector FAHLBERG	Bechtel Hanford Inc.
		Received By/Stored In	Received By/Stored In	Received By Stored In	CO Received Dy/Stated In	102 Provide Washington L. Tho	Received By/Stored In					5.17.0 2 1103	sample Date Sam	-	ALYSIS	volune	47	No. of Container(s)	Type of Container	75.210c Preservation	Offsite Property No.	Field Logbook No. EL 1517 • 3	Sampling Location 200 W	Company Contact D JACQUES	CHAIN OF CU
	Title	Date/Time		Date/Time	Date/Time	JOSPACTIME COED	1105					×			See item (1) in Chromium Special Hex - 7196 Instructions.		250mL 120mL	(s) 1 1	er aG aG	Cool 4C Cool 4C	B\$ 2013	COA B20CW5674C		Telephone No. 372-9651	CHAIN OF CUSTODY/SAMPLE
Disposed By		(Add-on) (Curium 243)	Europium 155, Nichbium 94, Radiun Neptunium 237, Nickel-03, Strontit	(1) Seni-VA - 62/04 (100), Seni-VA - 62/04 (200-01) (1,5,7 11) Industry Sources Complete (103) (100) Seni-VA (200-1) (1,5,7 11) Industry Sources (103) Seni-VA (200-01) (103) Seni-VA (200-01) Se	(3) VOA - 8260A (TCL); VO2 IX Add-On) {Tetrahydrofuran}	ICP Metals - 6010A (Supertrace Add-On) {Beryllium, Boron, Copper, Magnesium, Manganese, Molybdenum, Nickel, Vanadium, Zinc}; Mercury - 7470 • (CV) (2) C Anions • 300.0 {Fluoride, Nitrate, Sulfate}; Ammonia - 350.3; NO2/NO3 • 353.1; Sulfides • 9030	Oce Sect. (1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver};	SPECIAL INSTRUCTIONS				×			um See item (2) in PCBs - 8082 196 Special Instructions.		L 1000mL 250mL		P aG	Coel 4C Co	139	75674C			E ANALYSIS
		1 1	obium 94, Badium 276, Radium 278), Isotopic Thorium (Thorium-232); Carbon-14; ichter 35, Strontium 870: Tolal St., Technetium 89, Tittium 143, Isotopic Utanitum 143, Isotopic Utanitum 143, Isotopic Utanitum 144, Isotopic Utanitum 244, Americani 2	23 /023 (1 CL), Settle V CA = 82 /023 (2500201) [1,5,77 13111000] SOURCES (C. STONDO) - Compilere (Cesium-134, Cesium-137, Cobalt-60, Europhum-152, Europhum-154)	. (TCL), VOA - 8260A (Add-On) {Trichloromonofluoromethane}; VOA - 8260A (App ahydrofuran} 270A (TCF) - Semi, VOA - 8770A (Add-On) [1] 2 4 Trimethylbenzene, Cyclobexanon	race Add-On) {Beryllium, B fium, Zinc}; Mercury - 747(ride, Nitrate, Sulfate}; Amr	pertrace) (Arsenic, Barium,	ONS	Ref#	Personi		>			See item (3) in Special Instructions.		250mL	base	ដំប	Cool 4C	Bill of Lading/Air Bill No.	Method of Shipment Fed EX	SAF No. B02-050	Project Coordinator TRENT, SJ	REQUEST
			226. Radium 228. Leolopic Thorium (Thorium-232.); Carbo 18950 - Tolal St., Technetion 99, Titium 413, Leolopic U Al Cusum 34 (American 24.), American 24./Cusum	, Cobalt-60, Europium-152	chloromonofluoromethane)	oron, Copper, Magnesium,) - (CV) 10nia - 350.3; NO2/NO3 - 3	Cadmium, Chromium, Lea		Ref # 217 on 5/21/02	Personnel not available to relinquish samples from the .		7	×		See item (4) in TPH-Dussel See Special Range - Instructions TPH-Gasoline Range - WTPH-G		250mL 120mL		a(; a)	, c	1 2 5 E		Air Quality	Price Code 8N	B02-050-27
Date/Time	Date/Time	275.21.02	$\overline{}$		ī	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	····		32	3728	7.				See tem () in See ten (o) in Special Instructions. Instructions.		1000mL /120mL		***************************************	F	ds PC			Data Tu 45	50-27 Page 1 of
		60	V=Vegetation X=Other	WI=Wipe L=Liquid	A=Air DS=Drum Solids DL=Drum Liquids	SI=Sludge W = Water O=Oil	S=Soil SE=Sediment SO=Solid	Matrix *					BIYLKU		+ 120		17						Days	around	ı, T

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 5-22.02

SAF# / SOV	# / Release #: 15	302.	050
$\omega \alpha i \pi i \sigma \sigma i$	m / 10010030 11 · 1		

Laboratory SDG #:

0205 6734

NOTE:	ALL ENTRIES MARKED "NO" MUST BE				
1.	Custody seals on coolers or shipping container intact, signed and dated?	D Yes	□ No	□ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	□ Yes	□ No	□ N/A	☐ see Comment #
3.	Airbill # recorded?	11) Yes	□ No	□ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	□Xes .	□ No .	□ N/A	□ see Comment #
5.	Sample containers are intact?	□ Yes	□ No	N/A	□ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	D Yes	□ No	□ N/A	See Comment #
7.	All samples on coc received?	□ Yes	□ No	□ N/A	see Comment #
8.	All sample label information matches coc?	Ø-Yes	□ No	□ N/A	□ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	DXes	□ No	□ N/A	☐ see Comment #
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	DY es	□ No	□ N/A	see Comment #
11.	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	D-N/A	☐ see Comment #
12.	coc signed and dated?	D/Y es	□ No	□ N/A	see Comment #
13.	coc faxed or emailed to client?	□ Yes	□ No	□ N/A	□ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	□ Yes	□ No	□ N/A	☐ see Comment #

Cooler # / temp and Comments:

02.0004 22

Laboratory Sample Custodian:

Laboratory Project Manager:

9



Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B14KC7						
SILVER, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
SILVER, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
SILVER, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
ARSENIC, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
ARSENIC, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
ARSENIC, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
BORON, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
BORON, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
BORON, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
BARIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
BARIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
BARIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
BERYLLIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
BERYLLIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
BERYLLIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
CADMIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
CADMIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
CADMIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
CHROMIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
CHROMIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
CHROMIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
COPPER, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
COPPER, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
COPPER, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
MERCURY, TOTAL	001	S	02C0159	05/17/02	06/06/02	06/07/02
MERCURY, TOTAL	001 REP	S	02C0159	05/17/02	06/06/02	06/07/02
MERCURY, TOTAL	001 MS	S	02C0159	05/17/02	06/06/02	06/07/02
MAGNESIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
MAGNESIUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
MAGNESIUM, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
MANGANESE, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
MANGANESE, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02
MANGANESE, TOTAL	001 MS	S	02L0299	05/17/02	06/09/02	06/09/02
MOLYBDENUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
MOLYBDENUM, TOTAL	001 REP	S	02L0299	05/17/02	06/09/02	06/09/02

Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02 LVL LOT # :0205L734

CLIENT ID /ANALYSIS	LVL ‡	# MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MOLYBDENUM, TOTAL	001 1	MS S	02L0299	05/17/02	06/09/02	06/09/02
NICKEL, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
NICKEL, TOTAL	001 F		02L0299	05/17/02	06/09/02	06/09/02
NICKEL, TOTAL	001 1		02L0299	05/17/02	06/09/02	06/09/02
LEAD, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
LEAD, TOTAL	001 I		02L0299	05/17/02	06/09/02	06/09/02
LEAD, TOTAL	001 1		02L0299	05/17/02	06/09/02	06/09/02
SELENIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
SELENIUM, TOTAL	001 I	REP S	02L0299	05/17/02	06/09/02	06/09/02
SELENIUM, TOTAL	001		02L0299	05/17/02	06/09/02	06/09/02
VANADIUM, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
VANADIUM, TOTAL	001	REP S	02L0299	05/17/02	06/09/02	06/09/02
VANADIUM, TOTAL	001 1		02L0299	05/17/02	06/09/02	06/09/02
ZINC, TOTAL	001	S	02L0299	05/17/02	06/09/02	06/09/02
ZINC, TOTAL	001	REP S	02L0299	05/17/02	06/09/02	06/09/02
ZINC, TOTAL	001 1		02L0299	05/17/02	06/09/02	06/09/02
AB QC:						
<u>, </u>						
				4-		0.5 (0.0 (0.0
SILVER LABORATORY	LC1		02L0299	N/A	06/09/02	06/09/02
SILVER, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
ARSENIC LABORATORY	LC1		02L0299	N/A	06/09/02	06/09/02
ARSENIC, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
BORON LABORATORY	LC1		02L0299	N/A	06/09/02	06/09/02
BORON, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
BARIUM LABORATORY	LC1		02L0299	N/A	06/09/02	06/09/02
BARIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
BERYLLIUM LABORATORY	LC1		02L0299	N/A	06/09/02	06/09/02
BERYLLIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
CADMIUM LABORATORY	LC1	BS S	02L0299	N/A	06/09/02	06/09/02
CADMIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
CHROMIUM LABORATORY	LC1	BS S	02L0299	N/A	06/09/02	06/09/02
CHROMIUM, TOTAL	MB1	S	02L0299	A\N	06/09/02	06/09/02
COPPER LABORATORY	LC1	BS S	02L0299	N/A	06/09/02	06/09/02
COPPER, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
MERCURY LABORATORY	LC1	BS S	02C0159	A\N	06/06/02	06/07/02
MERCURY, TOTAL	MB1	S	02C0159	A\N	06/06/02	06/07/02
MAGNESIUM LABORATORY	LC1	BS S	02L0299	N/A	06/09/02	06/09/02

Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02

LVL LOT # :0205L734

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MAGNESIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
MANGANESE LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
MANGANESE, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
MOLYBDENUM LABORATOR	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
MOLYBDENUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
NICKEL LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
NICKEL, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
LEAD LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
LEAD, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
SELENIUM LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
SELENIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
VANADIUM LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
VANADIUM, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02
ZINC LABORATORY	LC1 BS	S	02L0299	N/A	06/09/02	06/09/02
ZINC, TOTAL	MB1	S	02L0299	N/A	06/09/02	06/09/02



Analytical Report

Client: TNU-HANFORD B02-050

LVL#: 0205L734

SDG/SAF#: H1788/B02-050

W.O.#: 11343-606-001-9999-00

Date Received: 05-22-02

METALS CASE NARRATIVE

1. This narrative covers the analysis of 1 soil sample.

- 2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.
- 3. All analyses were performed within the required holding times.
- 4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
- 6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
- 7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
- 8. All ICP Interference Check Standards were within control limits.
- 9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
- 10. The matrix spike (MS) recoveries for 3 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
- 11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration level for the following analytes:

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of pages.

		$\underline{\mathrm{PDS}}$	$\underline{\mathrm{PDS}}$
Sample ID	<u>Element</u>	Concentration (ppb)	% Recovery
B14KC7	Chromium	200	104.2
	Magnesium	200	91.2
	Manganese	2000	106.9

- 12. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
- 13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
- 14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

gmb/m05-734

 $\frac{C_{13}/\Lambda}{\text{Date}}$



METALS METHOD GLOSSARY

	ods are used as refere	for the digestion	and analysis	of samples co	ntained within this
Lot#: 0205L	734		and unity of	•	
Leaching Procedure	:131013111	312 _Other:			
CLP Metals Diges	stion and Analysis	Methods:ILM03	.0 _ILM04.0		00 # 001#
Metals Digestion Me	thods:3005A3 Other:	010A _3015 _303	$20A \sqrt{3050B}$	305120	J0.7 <u>_</u> SS17
		etals Analysis Me	thods		
	TAT	cturs 121141y		EPA	in an a support A Ta M. A
	SW846	EPA	STD MTD	OSWR	USATHAMA
	6010B	200.7			99
Aluminum	6010B 7041 5	200.7204.2			_99
Antimony	$\sqrt{6010B} - 7060A^{5}$	$\frac{-200.7}{200.7}$ $\frac{-206.2}{}$	3113B		99
Arsenic	6010B700011	200.7			99
Barium	76010B	200.7		1	99
Beryllium	<u>√</u> 6010B ¹	200.7 1		1620	99
Bismuth	6010B	200.7			99
Boron	$\frac{3}{6010B}$ _7131A 5	-200.7 -213.2			99 99
Cadmium	6010B	200.7			
Calcium	76010B _7191 ⁵	200.7 218.2			SS17
Chromium Cobalt	6010B	200.7			99
	$\sqrt{6010B}$ _7211 ⁵	200.7220.2	e.		99
Copper Iron		200.7	2112B		99
Lead	$\sqrt{6010B}$ $\sqrt{7421}$ 5	200.7239.2	_3113B	1620	99
Lithium	6010B7430 ⁴	200.7		1020	99
Magnesium	$\sqrt{2}6010B$	_200.7			99
Manganese	$\sqrt{6010B}$	200.7			 99
Mercury	7470A 3 <u>/</u> 7471A	³ 245.1 ² 245.5 ²			<u></u> 99
Molybdenum	<u> </u>	-200.7			99
Nickel	6010B	$\frac{200.7}{200.7}$ 258.1 4			 99
Potassium	6010B7610 ⁴			1620	<u>99</u>
Rare Earths	6010B '	$\frac{200.7}{200.7}$	3113B		99
Selenium	$\sqrt{2}6010B - 7740^{5}$			1620	99
Silicon	6010B ¹	-200.7		1620	99
Silica	_6010B	$\frac{200.7}{200.7}$ 272.2			99
Silver	76010B _7761 s	$\begin{array}{cccccccccccccccccccccccccccccccccccc$			99
Sodium	6010B7770 '	$\frac{-200.7}{200.7}$			99
Strontium	_6010B		200.9		99
Thallium	6010B7841 ⁵				99
Tin	6010B				99
Titanium	6010B	$-\frac{200.7}{200.7}$		1620	99
Uranium	6010B 1	$\frac{-200.7}{200.7}$			99
Vanadium	6010B	200.7			99
Zinc	6010B	200.7		1620	99
Zirconium	6010B ¹			-	
Othors	Meth	od:		L-WI-	-033/M-03/01

Other:_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- * = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LCS = Laboratory Control Sample.

NC = Not calculated.

ANALYTICAL METAL METHODS

- Not included in the method element list.
- 2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, 0.1 grams of sample is taken to a final volume of 50 mL (including all reagents).
- Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, three 0.1 gram of sample is taken to a final volume of 50 mL (including all reagents).
- 4. Flame AA.
- 5. Graphite Furnace AA.

RFW 21-21L-033/N-10/96

INORGANICS DATA SUMMARY REPORT 06/13/02

CLIENT: TNUHANFORD B02-050 H1788

LVL LOT #: 0205L734

REPORTING

DILUTION

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
======			=======	=====		
-001	B14KC7	Silver, Total	0.05 u	MG/KG	0.05	1.0
		Arsenic, Total	0.57	MG/KG	0.26	1.0
		Boron, Total	0.15 u	MG/KG	0.15	1.0
		Barium, Total	53.9	MG/KG	0.01	1.0
		Beryllium, Total	0.29	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	10.2	MG/KG	0.05	1.0
		Copper, Total	8.6	MG/KG	0.03	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Magnesium, Total	2360	MG/KG	0.59	1.0
		Manganese, Total	217	MG/KG	0.01	1.0
		Molybdenum, Total	0.72	MG/KG	0.12	1.0
		Nickel, Total	10.9	MG/KG	0.1	1.0
		Lead, Total	2.0	MG/KG	0.18	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
		Vanadium, Total	19.6	MG/KG	0.07	1.0
		Zinc, Total	21.8	MG/KG	0.04	1.0

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/13/02

CLIENT: TNUHANFORD B02-050 H1788

LVL LOT #: 0205L734

					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
======				=====		=======
BLANK1	02L0299-MB1	Silver, Total	0.05 u	MG/KG	0.05	1.0
		Arsenic, Total	0.25 u	MG/KG	0.25	1.0
		Boron, Total	0.14 u	MG/KG	0.14	1.0
		Barium, Total	0.19	MG/KG	0.01	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	4 1.0
		Chromium, Total	0.05 u	MG/KG	0.05	1.0
		Copper, Total	0.03 u	MG/KG	0.03	1.0
		Magnesium, Total	4.8	MG/KG	0.56	1.0
		Manganese, Total	0.19	MG/KG	0.01	1.0
		Molybdenum, Total	0.11 u	MG/KG	0.11	1.0
		Nickel, Total	0.09 u	MG/KG	0.09	1.0
		Lead, Total	0.17 u	MG/KG	0.17	1.0
		Selenium, Total	0.35 u	MG/KG	0.35	1.0
		Vanadium, Total	0.07 u	MG/KG	0.07	1.0
		Zinc, Total	0.04 u	MG/KG	0.04	1.0
BLANK1	02C0159-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

INORGANICS ACCURACY REPORT 06/13/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	TRUOMA	%RECOV	FACTOR (SPK)
	=======================================			======	=====	~=====	========
-001	B14KC7	Silver, Total	4.9	0.05u	5.3	92.5	1.0
		Arsenic, Total	201	0.57	211	94.8	1.0
		Boron, Total	89.7	0.15u	106	84.9	1.0
		Barium, Total	279	53.9	211	106.6	1.0
		Beryllium, Total	5.3	0.29	5.3	94.6	1.0
		Cadmium, Total	5.1	0.03u	5.3	96.2	1.0
		Chromium, Total	44.1	10.2	21.1	160.7	1.0
		Copper, Total	38.5	8.6	26.4	113.3	1.0
		Mercury, Total	0.18	0.02u	0.18	101.1	1.0
		Magnesium, Total	5690	2360	2640	126.2	1.0
		Manganese, Total	394	217	52.8	333.5*	1.0
		Molybdenum, Total	97.4	0.72	106	91.5	1.0
		Nickel, Total	65.4	10.9	52.8	103.2	1.0
		Lead, Total	56.6	2.0	52.8	103.4	1.0
		Selenium, Total	197	0.37u	211	93.5	1.0
		Vanadium, Total	82.5	19.6	52.8	119.1	1.0
		Zinc, Total	87.4	21.8	52.8	124.2	1.0

INORGANICS PRECISION REPORT 06/13/02

CLIENT: TNUHANFORD B02-050 H1788

LVL LOT #: 0205L734

		INITIAL				DILUTION
SITE ID	ANALYTE	RESULT	REPLICATE	RPD		FACTOR (REP)
		=======	=======	======		
B14KC7	Silver, Total	0.05u	0.05u	NC		1.0
	Arsenic, Total	0.57	0.60	5.0		1.0
	Boron, Total	0.15u	0.15u	NC		1.0
	Barium, Total	53.9	40.6	28.1		1.0
`	Beryllium, Total	0.29	0.28	0.60		1.0
	Cadmium, Total	0.03u	0.03u	NC		1.0
	Chromium, Total	10.2	15.6	41.9		1.0
	Copper, Total	8.6	7.7	11.0		1.0
	Mercury, Total	0.02u	0.02u	NC		1.0
	Magnesium, Total	2360	2380	0.66		1.0
	Manganese, Total	217	218	0.46		1.0
	Molybdenum, Total	0.72	0.51	35.4		1.0
	Nickel, Total	10.9	12.9	16.8		1.0
	Lead, Total	2.0	2.1	4.9		1.0
	Selenium, Total	0.37u	0.37u	ИC		1.0
	Vanadium, Total	19.6	18.4	6.3		1.0
	Zinc, Total	21.8	21.1	3.3		1.0
		B14KC7 Silver, Total Arsenic, Total Boron, Total Barium, Total Beryllium, Total Cadmium, Total Chromium, Total Copper, Total Mercury, Total Magnesium, Total Magnesium, Total Magnesium, Total Molybdenum, Total Nickel, Total Lead, Total Selenium, Total Vanadium, Total	SITE ID ANALYTE RESULT B14KC7 Silver, Total 0.05u Arsenic, Total 0.57 Boron, Total 0.15u Barium, Total 53.9 Beryllium, Total 0.29 Cadmium, Total 0.03u Chromium, Total 10.2 Copper, Total 8.6 Mercury, Total 0.02u Magnesium, Total 2360 Manganese, Total 217 Molybdenum, Total 0.72 Nickel, Total 10.9 Lead, Total 2.0 Selenium, Total 0.37u Vanadium, Total 19.6	SITE ID ANALYTE RESULT REPLICATE B14KC7 Silver, Total 0.05u 0.05u Arsenic, Total 0.57 0.60 0.5u Boron, Total 0.15u 0.15u 0.15u Barium, Total 53.9 40.6 0.29 0.28 Cadmium, Total 0.03u 0.03u 0.03u 0.03u Chromium, Total 10.2 15.6 0.02u 0.02u 0.02u Mercury, Total 8.6 7.7 0.02u 0.02u 0.02u 0.02u Magnesium, Total 2360 2380 2380 2380 2380 0.51 0.5	SITE ID ANALYTE RESULT REPLICATE RPD B14KC7 Silver, Total 0.05u 0.05u NC Arsenic, Total 0.57 0.60 5.0 Boron, Total 0.15u 0.15u NC Barium, Total 53.9 40.6 28.1 Beryllium, Total 0.29 0.28 0.60 Cadmium, Total 10.2 15.6 41.9 Chromium, Total 10.2 15.6 41.9 Copper, Total 8.6 7.7 11.0 Mercury, Total 0.02u 0.02u NC Magnesium, Total 2360 2380 0.66 Manganese, Total 217 218 0.46 Molybdenum, Total 0.72 0.51 35.4 Nickel, Total 10.9 12.9 16.8 Lead, Total 2.0 2.1 4.9 Selenium, Total 0.37u 0.37u NC	### SITE ID ANALYTE RESULT REPLICATE RPD #### RESULT RESULT RESULT #### REPLICATE RPD #### RESULT RESULT #### REPLICATE RPD #### RESULT RESULT #### RESULT RESULT #### REPLICATE RPD #### RESULT RESULT #### RESULT RESULT #### REPLICATE RPD #### RESULT RESULT #### REPLICATE RPD #### RESULT ##### RESULT #### RESULT ##### RESULT ##### RESULT #### RESULT ##### RESULT #### RESULT #### RESULT ##### RESULT #### RESU

INORGANICS LABORATORY CONTROL STANDARDS REPORT 06/13/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

			SPIKED	SPIKED		
SAMPLE	SITE ID	ANALYTE	SAMPLE	AMOUNT	UNITS	%RECOV
======		=======================================		======	======	=====.
LCS1	02L0299-LC1	Silver, LCS	48.6	50.0	MG/KG	97.2
		Arsenic, LCS	930	1000	MG/KG	93.0
		Boron, LCS	467	500	MG/KG	93.5
		Barium, LCS	497	500	MG/KG	99.3
		Beryllium, LCS	24.2	25.0	MG/KG	96.8
		Cadmium, LCS	24.6	25.0	MG/KG	98.4
		Chromium, LCS	50.1	50.0	MG/KG	100.2
		Copper, LCS	124	125	MG/KG	99.6
		Magnesium, LCS	2450	2500	MG/KG	97.8
		Manganese, LCS	76.8	75.0	MG/KG	102.4
		Molybdenum, LCS	494	500	MG/KG	98.9
		Nickel, LCS	198	200	MG/KG	98.8
		Lead, LCS	246	250	MG/KG	98.2
		Selenium, LCS	899	1000	MG/KG	89.9
		Vanadium, LCS	254	250	MG/KG	101.5
		Zinc, LCS	96.5	100	MG/KG	96.5
LCS1	02C0159-LC1	Mercury, LCS	2.5	2.5	MG/KG	101.6

205C	134		FIELD PERSO	NNEL: C	OWF	LEIE	ONLY SI	TAUEU	A		<u>e</u>		.		D	E		F	G	100	NVILLETA	BORATOR	inc.	
ent HAN	Fok	D	SAF# BOZ	-050) (15	Refrigera	ator#	100 a 100 as	(1 8 7 3	6	6	\$10.60	7. ⁽ 10. 184)	1.74.Y.O.	6	6	a sover 1725 Grade Govern	,	9	887,780	45,45	100 AV 400	T. W.	
. Final Proj.	Samo	ing Date				#/Type C	Container	Liquid	·N	int	.0/	16.7 A	.4.5,0		IPL	1AC		1Ab	IAG	GANGERO.	22.Xpa	4		
oject #	1.(?	43 - 606 - 1	001-9999-00		400			Solid	معال	IAG	1/10				<u> </u>			<i>,,,,</i> , ∪	11			1000 A (0)		
oject Contac	t/Phon	e#	0.7			Volume		200	258	250	250	4			\mathcal{L}	250		120	120			-1		
nville Labo	ratory	Project Manager				Preserva	atives	14.714		-	اب						13.00%	-				4		
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TRIX DES: Soil - Sediment	Lab ID	Client ID/Description		Cho	Matrix QC Chosen (~)		Date Collected	Time Collected	Obsyn	624N	0625×	0003	07.53			INORG ()	MCIB		2002	ODAO	06,60			
- Solid - Sludge				MS	MSD	· ·	a garagaraya	1 (9 a. 11) az					t di ini	taris.	H		e Liberia		1	1		7		
- Water - Oil	001	B14KC	$\overline{2}$	- K	<u></u>	5	5-17-07	1105	14	1.	1					1								
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Solids - Drum						Second Control											113 S				1	A 7.4×	+	
Liquids EP/TCLP						—			a 1965 11 1966															
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Other Fish																								
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D 14-177	Inc		HAIN OF C	HOTOD	V/SAT	MPLI	EANALY	SIS	RE	QUEST		B02-	050-27	Page 1 of	
Bechtel Hanford Collector FAHLBERG	The.	Comp	D JACQUES 372-9651 TREN 1, 83								rice Code	BN	Data Turn 45 D		
Project Designation 216-Z-11 Ditch Borehole Sample	es		Sampling Location 200 W							No. 050	A	ir Quality 🗌 75 I			ays
Ice Chest No. SEE	OSPC		Logbook No. 1517 • 3		COA B20CW5674C				Fe	od of Shipmed EX					
Shipped To		1	e Property No.	P	7\$ 20139				ВШ	of Lading/Ai	r Bill No.	5EF	05	PC	
POSSIBLE SAMPLE HAZAR TO Special Handling and/or S	DS/REMARKS	P15.210	Preservation		ool 4C	Cool 4C	Cool 4C	Cool 4	4C	Cool 4C	Cool 4C	Cool 4C	None	None	
TIETO	314 CK	14	Type of Conta		aG	aG	P	aG	\dashv	aG	aG	aG	Р	aG	
Special Handling and/or S	torage		No. of Contain		1	1	1	1		1	1	1	1	1	
N	one		Volume	2	50mL	120mL	1000mL	250m	nL	250mL	250mL	120mL	1000mL	120mL 0	2
	YSIS			item (1) in Special structions.	Chromium Hex - 719		PCBs -	8082	See item (3) in Special Instructions.	See item (4) i Special Instructions	Range -	See item (5) is Special Instructions.	See itsm (6) in Special Instructions.	tie to	
Sample No.	Matrix *	Sample Dat	e Sample	Time									/		
B14KC7	SOIL	5.17.0	02 1105		×	メ	*	Х	Х		χ	~ _		-	BIYLK4
										Per rel Re	rsonnel no inquish si f# 24	ot available to amples from too 5/2	he 3728		
CHAIN OF POSSESSION	NC NC	Sign/P	rint Names				PECIAL INSTR	LUCTION	ons	1		. 1/1			Matrix *
										Ifides - 9030 8260A (App cyclohexanone, m. 154 Carbon-14; pic Uranium	S=Soil SE=Sediment SO=Solid SI=Studge W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other				
LABORATORY Received SECTION	Ву				Tit	tle								Date/Time	
FINAL SAMPLE Disposal DISPOSITION	Method				· · · · · · · · · · · · · · · · · · ·		Disp	posed By	<i>y</i>			•		Date/Time	

LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 5-22.02

SAF#/SOW#/Release #: 302.050

Laboratory SDG #:

02056734

	ALL ENTRIES MARKED "NO" MUST BE E	D Yes	□ No	□ N/A	isee Comment #
1.	Custody seals on coolers or shipping container intact, signed and dated?				
2.	Outside of coolers or shipping containers are free from damage?	₽ X es	□ No	□ N/A	□ see Comment #
3.	Airbill # recorded?	D Y es	□ No	□ N/A	□ see Comment a
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	□Xes .	. 🗖 No	□ N/A	☐ see Comment
5.	Sample containers are intact?	ДYes	□ No	□ N/A	□ see Comment
6.	Custody seals on sample containers intact, signed and dated?	D.Yes	□ No	□ N/A	□ see Comment
7.	All samples on coc received?	□Xes	□ No	□ N/A	see Comment
8.	All sample label information matches coc?	⊠Yes	□ No	□ N/A	□ see Comment
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	D.Yes	□ No	□ N/A	□ see Comment
10.	Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	D Y es	□ No	□ N/A	see Commen
11	Where applicable, bar code labels are affixed to coc?	□ Yes	□ No	D-N/A	□ see Commen
12	. coc signed and dated?	D/Yes	□ No	□ N/A	□ see Commer
13	. coc faxed or emailed to client?	□ Yes	□ No	□ N/A	□ see Commer
14	 Project Manager/Client contacted concerning discrepancies? (name/date) 	□ Yes	□ No	□ N/A	□ see Comme

Cooler # / temp and Comments:

.02.0004 22

Laboratory Sample Custodian:

Laboratory Project Manager:

Will Neenand

SAMPLE DIGESTION RECORD

Digestion Batch #:	0210	299	М	ethod: S	sw	SOP: L-S 3005A	PI-3020 Rev. 00 DW	200.7 (1994)	
				rcle)		3010A	Σ,.	200.9	
Date/Time Initiated: Date/Time Completed: Analyst(s): PGOP		3015		3113B					
Analyst(s): Rons	0010	2100			3020A		U.1.0.0		
Matrix: (Soil Water C)ther:					7060A (As/Se) MCAWW	200.7 (1982)	\
						7760A (Ag)) 1/10/1/1/1/	200 (AA)	1
Instr. Type: AA (IC Parameters: Cee	BUCK	na				770011 (116)		206.2 (As/Se	(ء
Parameters.	, poet					3050B		200.2 (715/0)	"
Ci i d'il d'i catad	(-:1	-				305011	SM	3030C (MC)	
Digested Undigested	(circle on	e)				3031	SIVI	3030C (NC)	
	-20 Y) NA 6				CI P	ILMO3.0	Other		
Balance Cal Verif:	Y) NA 920				CLI	ILMO3.0	Other		H-W-00-1
Hot Plate Temp:	9		RT	JZ, "	M	U1			
	T 6 3	T 7 111-1							
	Spike	Initial Wt/Vol	Final Vol	pH	Type: To/So/		Color/Appearanc	e Artifact	Turb
COC Batch #	Vol(s) (mL)	(g/mL)	(mL)	Pri	TC	Texture	Cololinsppearaile	Aitilact	1 44.0
		1.01	100		1	0.0.00	00.00		
02051620-005	1		100	Nin	TOT	course	Brewn	MAY	MA
-005R		1.02	 	↓↓					
\$-0055	1.0	1001							
-006		1.03					APPEL		
02051665-00		1.04			1 T	Fine		Soil	
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02051734-001		1.05		$\bot \bot$	 				
-001R	3	1.06							
-0015	1.0	1.05							
172L0299-MB	l I	1.00				NIA	cear	NIA	
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Spiking IDs:		Rea	gent IDs:				File ID#: 二	ブ グラ ハロハ	3 .
MS#: \$100-	02-05	HNO		•	XIH	041		_	dors
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	~7	Н20		<u></u>	LUOV	127HIL			
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DCD II.	-C/-	_					Ly 4	11/0	
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1.571.30	20-A-0601			بسلير	NP (0)	2		Page #: 0°	71

Lionville Laboratory

MERCURY PREPARATION

		a .
Incorporated, 1		Logbook #_8979
Analyst: Mulh	Instrument ID Holil	Prep Batch: 0200/59
Date (6/6/02	Balance #: B29 /N/	
Start Time/Temp: 19/5 /95%-	Pipette Calibration (Daily)	OP No. ME-7470A, Rev. (
End Time/Temp: 1945/98°C	•	

pH < 2 for Liquids? __Yes MA No (If no: designate affected samples in Comments column, and initiate an SDR)

NOTE: The Initial/Final Volume for water samples = 33mL, unless otherwise noted.

The Final volume for soil samples = 50mL, unless otherwise noted.

LvLI Batch #	Container Number	Spike Volume (mL)	Spike Conc. (μg/L)	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)	Comments, % Solids, etc.
Hank	516			10ml	Strl	
0. Zugle	DIO	0.100		ļ	<u> </u>	
1.0 wall	702	0,500				
2.0 lull	50	1,000				
5.0 mg/l	28	2.500				
10.0 ugl	301	5,000				
IW	761	0.176	2.5			
cw	1435	0.250	5.0			
ILB/CES	210/505					7 robits
MBI	910			0309-	-	186159 100.00
LCA	207	*	X	011952		LUSAUSISG 1
0706L866-001 A	56			0.32gr		My 49.41
soir 1	KIZ			0.319)
0015	750	0.500	1,0	0.31gr 0.33gr 0.31gr		
002 1	81L			0.310-		87.89
02052710-181 B	116			0.3kg		97,39
DIR 1	80			0.30gr		
0013	પપ	0,500	1.0	0,315		
0205L734-001	77			0.3192		90,19
MIR	32			0.34gr		
0015	810	0.500	1.0	0.31gm		
0205L735-001	204			0.39g		95,50

Standard:	ID	Prep Date/Time	Reviewed By/Date:
ICAL/MS	EM-EU3ZBOZUZ	6/6/02 1730	
CV/CCV/LCS	US-USOSAEVUTO		
			See book # <u> 4Sン)</u> for std traceability information

Soil LCS = ERA Metals in soil; True Value = 2.48 mg/Kg Catalogue # 540, Lot # 245

Water Matrix Spiking Solution Concentration= 0.1µg/ml

Water LCS Spiking Concentration: 1.0 µg/ml

| Logbook # S979 | Instrument ID Hold | Prep Batch: UZCO(S9 | Worksheet: How U7(1) | Pipette Calibration (Daily) | OP No. ME-7470A, Rev. 00 | ME-7470A, Rev. 00 |

pH < 2 for Liquids? __ Yes MH No (If no: designate affected samples in Comments column, and initiate an SDR)

NOTE: The Initial/Final Volume for water samples = 33mL, unless otherwise noted.

The Final volume for soil samples = 50mL, unless otherwise noted.

LvLl Batch#	Containe Number		Spike Conc. (µg/L)	Initial Wt. or Volume (g or mL)	Final Sample Volume (mL)		iments, lids, etc.
0205L735-001R	B A86			0.35g	50 ml		95.50
	1 325	8,500	1.0	0.400			7
002	A 801			0.33gm			96.58
	c 95			0.36gr		RAO	100,00
02052758-001	B A31			0.33cm	<u> </u>		
				/			
	\rightarrow						
		A	10/				
		//*	Vé/de	/			
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			<u> </u>		\		
					+		
							
						+	
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Standard:	ID	Prep Date/Time	Reviewed By/Date:	
ICAL/MS				
PICT/PGV/LCS	See page 014B			
			See book # <u>4527</u> for std trace	eability information

Soil LCS = ERA Metals in soil; True Value = 2.48 mg/Kg Catalogue # 540, Lot # 245 Water Matrix Spiking Solution Concentration= 0.1μg/ml Water LCS Spiking Concentration: 1.0μg/ml



Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1788

LVL LOT # :0205L734 DATE RECEIVED: 05/22/02 CLIENT ID /ANALYSIS LVL # MTX PREP # COLLECTION EXTR/PREP ANALYSIS B14KC7 S 02L%S054 05/17/02 05/29/02 % SOLIDS 001 05/30/02 001 REP S 02L%S054 05/17/02 05/29/02 05/30/02 % SOLIDS 001 S 02LICB40 05/17/02 06/07/02 06/07/02 FLUORIDE BY IC FLUORIDE BY IC 001 REP S 02LICB40 05/17/02 06/07/02 06/07/02 05/17/02 FLUORIDE BY IC 001 MS S 02LICB40 06/07/02 06/07/02 S 02LICB40 05/17/02 06/07/02 06/07/02 NITRATE BY IC 001 NITRATE BY IC 001 REP S 02LICB40 05/17/02 06/07/02 06/07/02 NITRATE BY IC 05/17/02 06/07/02 001 MS S 02LICB40 06/07/02 05/17/02 06/10/02 001 S 02LVI017 06/10/02 CHROMIUM VI 06/10/02 001 REP S 02LVI017 05/17/02 06/10/02 CHROMIUM VI S 05/17/02 CHROMIUM VI 001 MS 02LVI017 06/10/02 06/10/02 001 MSD S 02LVI017 05/17/02 06/10/02 CHROMIUM VI 06/10/02 SULFATE BY IC 001 S 02LICB40 05/17/02 06/07/02 06/07/02 SULFATE BY IC 001 REP S 02LICB40 05/17/02 06/07/02 06/07/02 001 MS S 02LICB40 05/17/02 06/07/02 06/07/02 SULFATE BY IC 001 06/12/02 NITRATE NITRITE S 02LN3C34 05/17/02 06/12/02 06/12/02 NITRATE NITRITE 001 REP S 02LN3C34 05/17/02 06/12/02 06/12/02 001 MS S 02LN3C34 05/17/02 06/12/02 NITRATE NITRITE 001 S 02LAMA16 05/17/02 06/10/02 06/10/02 AMMONIA 001 REP S 02LAMA16 05/17/02 06/10/02 06/10/02 AINOMMA 001 MS S 02LAMA16 05/17/02 06/10/02 06/10/02 AINOMMA 001 S 02LSDA19 SULFIDE 05/17/02 05/22/02 05/22/02 001 REP 05/22/02 SULFIDE S 02LSDA19 05/17/02 05/22/02 001 MS S 02LSDA19 05/17/02 05/22/02 05/22/02 SULFIDE LAB QC: FLUORIDE BY IC MB1 S 02LICB40 N/A06/07/02 06/07/02 MB1 BS N/A06/07/02 06/07/02 FLUORIDE BY IC S 02LICB40 N/A06/07/02 06/07/02 NITRATE BY IC MB1 S 02LICB40 06/07/02 N/A06/07/02 NITRATE BY IC MB1 BS S 02LICB40 MB1 S 02LVI017 N/A06/10/02 06/10/02 CHROMIUM VI MB1 BS S 02LVI017 N/A 06/10/02 06/10/02 CHROMIUM VI MB1 BSD S 02LVI017 N/A 06/10/02 06/10/02 CHROMIUM VI S 02LICB40 MB1 N/A06/07/02 06/07/02 SULFATE BY IC

Lionville Laboratory, Inc. INORGANIC ANALYTICAL DATA PACKAGE FOR TNUHANFORD B02-050 H1788

DATE RECEIVED: 05/22/02

LVL LOT # :0205L734

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SULFATE BY IC NITRATE NITRITE NITRATE NITRITE AMMONIA AMMONIA SULFIDE	MB1 BS MB1 BS MB1 BS MB1 BS MB1 BSD MB1	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	02LICB40 02LN3C34 02LN3C34 02LAMA16 02LAMA16 02LAMA16 02LAMA19	N/A N/A N/A N/A N/A N/A	06/07/02 06/12/02 06/12/02 06/10/02 06/10/02 06/10/02 05/22/02	06/07/02 06/12/02 06/12/02 06/10/02 06/10/02 06/10/02 05/22/02
SULFIDE	MB1 BS	S	02LSDA19	N/A	05/22/02	05/22/02



Analytical Report

Client: TNU-HANFORD B02-050 H1788

LVL#: 0205L734

W.O.#: 11343-606-001-9999-00

Date Received: 05-22-02

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 soil sample.

- 2. The sample was prepared and analyzed in accordance with the methods indicated on the attached glossary.
- 3. Sample holding times as required by the method and/or contract were met.
- 4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
- 5. The method blanks were within the method criteria.
- 6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS for Ammonia was within the 20% Relative Percent Difference (RPD) control limit.
- 7. The matrix spike recoveries for Fluoride, Nitrate, Chromium VI, Sulfate, Nitrate Nitrite, Ammonia and Sulfide were within the 75-125% control limits.
- 8. The replicate analyses for Percent Solids, Fluoride, Nitrate, Chromium VI, Sulfate, Nitrate Nitrite, Ammonia and Sulfide were within the 20% Relative Percent Difference (RPD) control limit.
- 9. Results for solid samples are reported on a dry weight basis.
- 10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels

Laboratory Manager

Lionville Laboratory Incorporated

Date

njp\i05-734

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 13 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	<u>ASTM</u>	<u>SW846</u>	<u>OTHER</u>
% Ash	D2216-80		
% Moisture	D2216-80		_ ILMO4.0 (e)
% Solids	✓ D2216-80		ILMO4.0 (e)
% Volatile Solids	D2216-80		
ASTM Extraction in Water	D3987-81/85		
BTU	D240-87		
CEC		9081	C
Chromium VI		√ 3060A/7196A	
Corrosivity by coupon by pH		1110(mod) 9045C	
Cyanide, Total		9010B	ILMO4.0 (e)
Cyanide, Reactive		Section 7.3/9014	
Halides, Extractable Organic		9020B	EPA 600/4/84-008
Halides, Total		9020B	EPA 600/4/84-008
EP Toxicity		1310A	
Flash Point		1010	
Ignitability		1010	
Oil & Grease		9071A	
Carbon, Total Organic		9060	Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	D240-87(mod)		
Petroleum Hydrocarbons, Total Red	coverable	9071	EPA 418.1
pH, Soil		9045C	
Sulfide, Reactive		Section 7.3/9030B	
Sulfide		$\sqrt{9030B}$ (mod)	
Specific Gravity	D1429-76C/	D5057-90	
Sulfur, Total		9056	
Synthetic Preparation Leach		1312	
Paint Filter		9095A	
Other: Jewarde Mitrate	Juliate Method:	EPA 300,0 (mo	\mathcal{D} .
Other: Nitrate Nitrit	<u> </u>	EPA 353.2 (mo	
Amonia		EPA 350.3 (Mi	(,C c

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- * = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.

MS = Matrix Spike.

MSD = Matrix Spike Duplicate.

REP = Sample Replicate

LC = Laboratory Control Sample.

NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

- 1. ASTM Standard Methods.
- 2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
- 3. <u>Test Methods for Evaluating Solid Waste</u> (USEPA SW-846).
- a. <u>Standard Methods for the Examination of Water and Waste</u>, 16 ed, (1983).
- b. <u>Standard Methods for the Examination of Water and Waste</u>, 17 ed, (1989)/18ed (1992).
- c. <u>Method of Soil Analysis</u>, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
- d. <u>Method of Soil Analysis</u>, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
- e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
- f. Code of Federal Regulations.

INORGANICS DATA SUMMARY REPORT 06/28/02

CLIENT: TNUHANFORD B02-050 H1788
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0205L734

HOLLIC OLDE	11. 11515 000 001 5555					
					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
	=======================================			=====		=======
-001	B14KC7	% Solids	90.2	*	0.01	1.0
		Fluoride by IC	1.4 u	MG/KG	1.4	1.0
		Nitrate by IC	2.38	MG/KG	1.39	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
		Sulfate by IC	3.8	MG/KG	1.4	1.0
		Nitrate Nitrite	0.70	MG/KG	0.20	1.0
		Ammonia, as N	69.5	MG/KG	3.3	1.0
		Sulfide	22.6 u	MG/KG	22.6	1.0

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/28/02

CLIENT: TNUHANFORD B02-050 H1788

LVL LOT #: 0205L734

WORK ORI	DER: 1134	3-606-001	-9999-00
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WORK OKDE	W. 11343-000-001 3333	• •				
					REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
=====				=====	********	
BLANK10	02LICB40-MB1	Fluoride by IC	1.2 u	MG/KG	1.2	1.0
		Nitrate by IC	1.25 u	MG/KG	1.25	1.0
		Sulfate by IC	1.2 u	MG/KG	1.2	1.0
BLANK10	02LVI017-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0
BLANK10	02LN3C34-MB1	Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
BLANK10	02LAMA16-MB1	Ammonia, as N	2.5 u	MG/KG	2.5	1.0
BLANK10	02LSDA19-MB1	Sulfide	40.0 u	MG/KG	40.0	1.0

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INORGANICS ACCURACY REPORT 06/28/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK	ORDER:	11343-606-001-9999-00

			SPIKED	INITIAL	SPIKED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	AMOUNT	%RECOV	FACTOR (SPK)
======			======	******	======		
-001	B14KC7	Fluoride by IC	29.0	0.0	28.0	103.8	1.0
		Nitrate by IC	29.9	2.38	28.0	98.2	1.0
		Soluble Chromium VI	4.8	0.44u	4.4	103.4	1.0
		Insoluble Chromium VI	1210	0.44u	1000	121.5	100
		Sulfate by IC	31.3	3.8	28.0	98.0	1.0
		Nitrate Nitrite	6.2	0.70	5.4	102.9	1.0
		Ammonia, as N	281	69.5	181	116.8	1.0
		Sulfide	153	9.0	174	83.1	1.0
BLANK10	02LICB40-MB1	Fluoride by IC	26.6	1.2 u	25.0	106.6	1.0
		Nitrate by IC	24.4	1.25u	25.0	97.8	1.0
		Sulfate by IC	24.6	1.2 u	25.0	98.6	1.0
BLANK10	02LVI017-MB1	Soluble Chromium VI	4.1	0.40u	4.0	101.9	1.0
		Insoluble Chromium VI	1090	0.40u	966	113.3	100
BLANK10	02LN3C34-NB1	Nitrate Nitrite	5.2	0.20u	5.0	103.8	1.0
BLANK10	02LAMA16-MB1	Ammonia, as N	105	2.5 u	100	105.0	1.0
		Ammonia, as N MSD	97.5	2.5 u	100	97.5	1.0
BLANK10	02LSDA19-MB1	Sulfide	302	40.0 u	320	94.6	1.0

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INORGANICS DUPLICATE SPIKE REPORT 06/28/02

CLIENT: TNUHANFORD B02-050 H1788

LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

SPIKE#1 SPIKE#2

SAMPLE	SITE ID	ANALYTE	%RECOV	%RECOV	%DIFF	
		=======================================	=====	=====	=====	
BLANK10	02LAMA16-MB1	Ammonia, as N	105.0	97.5	7.4	

INORGANICS PRECISION REPORT 06/28/02

CLIENT: TNUHANFORD B02-050 H1788 LVL LOT #: 0205L734

WORK ORDER: 11343-606-001-9999-00

			INITIAL			DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	REPLICATE	RPD	FACTOR (REP)
	****		======	========	======	******
-001REP	B14KC7	% Solids	90.2	90.4	0.18	1.0
		Fluoride by IC	1.4 u	1.4 u	NC	1.0
		Nitrate by IC	2.38	2.34	1.4	1.0
		Chromium VI	0.44u	0.44u	NC	1.0
		Sulfate by IC	3.8	3.5	9.7	1.0
		Nitrate Nitrite	0.70	0.83	17.4	1.0
		Ammonia, as N	69.5	75.7	8.6	1.0
		Sulfide	22.6 u	31.1 u	NC	1.0

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| Lionville Labor                           | atory                     | Use Only (                       | Custo          | dy Tr    | ans           | sfe             | rF       | Rec             | ord/L                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | .ab                                      | Wc                                       | rk                                      | Re            | equ              | ies                                     | t P                                    | age_     | of       |                                                         |                | 1              | ž /            | 1                | , [                    | I          |
|-------------------------------------------|---------------------------|----------------------------------|----------------|----------|---------------|-----------------|----------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|-----------------------------------------|---------------|------------------|-----------------------------------------|----------------------------------------|----------|----------|---------------------------------------------------------|----------------|----------------|----------------|------------------|------------------------|------------|
| 02050                                     | 134                       | Z TA                             |                | IELD PER |               |                 |          | PLETE           | ONLY S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | HADED                                    | ARE                                      |                                         | C             |                  |                                         |                                        | Q        | E        |                                                         | F              | G              | T III          | V<br>DIVILLE     | ABORATO                | RÝ INC.    |
| Client HA                                 | VFO,                      | ep ''                            | VU-Ha<br>Sa    | FH PV    | 12-0          | 250             | )        | Refrige         | rator #                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                          | ΪĊ                                       | 6                                       | 6             |                  |                                         |                                        | 6        | 6        |                                                         | 6              | 6              |                |                  |                        |            |
| 5. A. | X 57 54                   | 원레가는 병사가 관심하는 것이 아니라입니다.         |                |          | 107-1-11/4-1- |                 |          | # <b>7</b> 7    | 04-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Liquid                                   |                                          |                                         | 74.88L        |                  |                                         | , t                                    | 989 F    |          |                                                         | 10.00<br>27.00 |                | a wedset       | 139              | 4.4                    |            |
| Project #                                 | 1 (                       | pling Date<br><u>3 43 - 6</u> 06 | - 001-9        | 1999-0   | ٥ -           |                 |          | #/Type          | Container                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Solid                                    | AC                                       | IAG                                     | IAG           |                  |                                         |                                        | 192      | IAL      |                                                         | IAL            | IAG            |                | 1.4              | <u> </u>               |            |
| Project Conta                             | ct/Pho                    | ne #                             |                |          |               |                 |          | Volume          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Liquid                                   |                                          |                                         |               |                  | 1,514.0                                 |                                        |          |          |                                                         |                | ()<br>() 217/2 |                |                  | 18.38                  | 11.00      |
|                                           |                           | Project Manag                    |                | _ · O ·  |               |                 |          | Volume          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Solid                                    | 250                                      |                                         | 250           |                  |                                         |                                        | L_       | 250      |                                                         | 120            | 120            | •              |                  | 7                      |            |
| ac Spec                                   |                           | Del STD                          | TAT            | 30       | days          |                 |          | Preserv         | /atives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                          |                                          | 1 -                                     | - <u></u> -   |                  |                                         |                                        |          | <u> </u> | 50                                                      | _              |                |                |                  |                        |            |
|                                           | _                         |                                  |                |          |               |                 |          | ANALY           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          | 4                                        |                                         | ANIC<br>⊅ m   | ٥                |                                         |                                        | To<br>A  | INO      |                                                         | Hey            | Die            | $\omega_{TPH}$ | .i> U            | STPA                   | A second   |
| Date Rec'd                                | 5-                        | 22-02                            | Date Due _     | 6-2      | 21-0          | ٤               |          | REQUE           | STED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          | VOA                                      | BNA                                     | To the second | Her Le           |                                         |                                        | Più      |          | S                                                       | THOM           | 9 70 TO S. N.  | TPH<br>GAGO    | ine<br>ie        |                        | -1476      |
| MATRIX                                    |                           |                                  |                |          |               | Mat             |          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          | <u> </u>                                 | 1                                       |               | 1                | 1                                       | Lionv                                  | ille La  | borato   | ory Us                                                  | e Onl          | y              | 1              | V .              | 1                      | Т          |
| S - Soil<br>SE - Sediment<br>SO - Solid   | Lab<br>ID                 | , CI                             | ient ID/Descri | ption    |               | Qi<br>Cho<br>(v |          | Matrix          | Date<br>Collected                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Time<br>Collected                        | 062×N                                    | 0625×                                   | 0008          |                  |                                         |                                        | INORG () | MCIB     |                                                         | CRG            | ODAO           | 06,60          |                  |                        |            |
| SL - Sludge                               | 000                       | 1-5                              |                |          | 05.0          | MS              | MSD      | Production      | a an arma a comen                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | a notations                              | +                                        | 0                                       | 2 12 2 2 2    |                  | 5 18 65 4                               | 53 523 52                              | R        | -        |                                                         | H              | V              | 0              |                  |                        |            |
| W - Water<br>O - Oil<br>A - Air           | $\mathcal{C}\mathcal{O}I$ | BIHKO                            | $U_{1}$        |          |               | V               | <b>V</b> | 5.              | 5-17-07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 1105                                     | 1                                        | 11                                      | 11            |                  |                                         | 10 1 d                                 |          | 1        | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1                   | $ I_{\perp} $  | P              |                | /_               |                        |            |
| DS - Drum<br>Solids                       |                           |                                  |                |          |               |                 |          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                                          |                                         |               |                  |                                         | 10.70                                  |          |          |                                                         |                |                | 2.800          | 7.7<br>10.8218.4 | 1000                   | Len 1/2    |
| DL - Drum                                 | <b> </b>                  |                                  |                |          |               |                 |          | 1.214           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                                          |                                         |               |                  | (4) (4) (4) (4) (4) (4) (4) (4) (4) (4) |                                        | 1.57     |          |                                                         |                | 1113           |                |                  |                        |            |
| Liquids L - EP/TCLP                       | <u> </u>                  |                                  |                |          |               |                 |          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 100                                      |                                          | 10.22                                   | 84.7          |                  |                                         |                                        |          |          |                                                         |                | sis John       |                |                  |                        |            |
| Leachate<br>WI - Wipe                     |                           |                                  |                |          |               |                 |          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1 |                                          | 368<br>2003                             |               |                  |                                         |                                        |          |          | 1,575                                                   |                |                |                | 37.7             |                        |            |
| X - Other<br>F - Fish                     |                           |                                  |                |          |               |                 |          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 5.035                                    | 12.56                                    |                                         | TOTAL S       |                  |                                         | 100                                    |          |          |                                                         |                |                |                |                  |                        | 123        |
|                                           | <u> </u>                  |                                  |                |          | 144.00        |                 |          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          | 2 10 10 10 10 10 10 10 10 10 10 10 10 10 |                                         |               |                  |                                         |                                        |          |          |                                                         |                | 3.8            |                |                  |                        |            |
|                                           | ļ                         |                                  |                |          |               |                 | 3.2      |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 11.576                                   |                                          |                                         |               |                  |                                         |                                        |          |          |                                                         |                | 1 2 July 1     |                | <u> </u>         |                        |            |
|                                           |                           |                                  |                |          |               |                 |          | 1.12            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                                          | 1/-                                     |               |                  | 10.87                                   |                                        |          |          |                                                         |                |                |                |                  |                        |            |
|                                           | <u> </u>                  |                                  |                |          |               |                 |          |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                                          |                                         |               | L                |                                         |                                        |          |          |                                                         |                |                |                |                  |                        |            |
| Special Instruc                           | tions:                    | SAF                              | # BOS-         | -050     |               |                 | M        | /REVISIO<br>とてい | 1. RC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | RA+                                      | Bo.                                      | B. (                                    | . A           | Иа.              | Mn                                      | Mo                                     | N:       | -        |                                                         |                | lle Lab        | oratory        | Use C            | )nly                   |            |
|                                           |                           |                                  |                |          |               |                 |          |                 | 2 V <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                          |                                          |                                         | <b></b>       | <del>.</del> J · | ·                                       |                                        | (        | 1 3      |                                                         | were/          |                |                |                  | sistant Se<br>nt on Ou |            |
|                                           |                           |                                  |                |          |               |                 | T.10     | A 60            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          | · ~                                      |                                         | F 41.         | 15.1             |                                         |                                        |          | -   н    | and De                                                  | livered        |                | Pa             | ackage           | or                     | N          |
|                                           |                           |                                  |                |          |               |                 | 1100     | re Gr (1)       | 3. ICFL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | , TC\00                                  | j, 1                                     | (704)                                   | 7.101         | 1310,            | 1403                                    | NZ,                                    | TEF      |          | LLY                                                     | Belo           | 2              | 2)<br>Pr       | Unbrol<br>ackage | ken on or              | Outer<br>N |
|                                           |                           |                                  |                |          |               |                 |          |                 | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                          |                                          |                                         |               |                  |                                         | ······································ |          | 2)       | ) Ambie                                                 | ent or C       | Silloo)        |                |                  | nt on Sa               | ample      |
|                                           |                           |                                  | ^              |          |               |                 |          |                 | . 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                                          |                                         |               |                  |                                         |                                        |          | - 3)     | ) Recei<br>conditio                                     | ved in         | Good<br>or N   | 41             | ) Unbro          | 0                      | or N       |
|                                           |                           |                                  |                |          |               |                 | . 6      |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                                          | *************************************** |               |                  |                                         | 4                                      | ) Samp   | les      |                                                         |                |                | or or          |                  |                        |            |
| Relinquishe                               | d                         | Receivedby                       | Date           | Time     | Re            | linqui          | shed     |                 | Received                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                          | Date                                     | Т                                       | me            |                  | crepano                                 |                                        |          | P        | Properly Preserved COC Record Present Upon Sample Rec't |                |                |                | esent<br>ec't    |                        |            |
| FOR                                       | _                         | 11111                            | 11-            | 1        | <b> </b>      | by              |          |                 | by                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ORIG                                     |                                          | -1                                      |               |                  | mples L<br>C Reco                       |                                        |          |          |                                                         | ved Wi         | thin           |                |                  |                        | or N       |
| 1 ren Esp                                 |                           | Henry                            | 5/22/02        | 1000     | <u> </u>      |                 |          | OSITI           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |                                          |                                         |               | NC               | TES:                                    |                                        |          |          | lolding                                                 | imes<br>Ø      | or N           |                | ooler<br>emp. 🕰  | 2.1                    | _ °C       |
|                                           |                           | <u> </u>                         | Ľ              |          |               |                 | ar W.    | STE             | To the same of the | REW                                      |                                          | I EN                                    | i.            | 12               | 905                                     | 29                                     | 37       | 109      | 0                                                       |                |                |                |                  |                        |            |

| Bechtel Hanford Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | C                                                           | HAIN OF CUST            | TODY/S                                      | AMPI                                                                                     | E ANALY                                                                                                                           | SIS      | REQUEST                                     |                                           | B02                                       | 2-050-27                                   | Page 1                                     | of <u>l</u> |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------|---------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------|---------------------------------------------|-------------------------------------------|-------------------------------------------|--------------------------------------------|--------------------------------------------|-------------|--|
| Collector<br>FAHLBERG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Company Contact Telephone No. Project Coordinator TRENT, SJ |                         |                                             |                                                                                          |                                                                                                                                   |          |                                             |                                           | rice Code                                 | 8N                                         | Data Tur                                   | •           |  |
| Project Designation<br>216-Z-11 Ditch Borehole Samples                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Sampl<br>200                                                | ling Location<br>) W    |                                             |                                                                                          |                                                                                                                                   |          | SAF No.<br>B02-050                          | A                                         | ir Quality                                |                                            | 45 Days                                    |             |  |
| ce Chest No. SEE OSP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             | Logbook No.<br>1517 - 3 |                                             | COA<br>B20CW                                                                             | 75674C                                                                                                                            |          | Method of Ship<br>Fed EX                    | ment .                                    |                                           |                                            |                                            |             |  |
| Shipped To                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1                                                           |                         | 70                                          | 201                                                                                      | 139                                                                                                                               |          | Bill of Lading/A                            | Air Bill No                               | 5 EF                                      | E 05                                       | PC                                         |             |  |
| POSSIBLE SAMPLE HAZARDS/REMARKS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 5.210                                                       | 2                       |                                             |                                                                                          |                                                                                                                                   |          |                                             |                                           | 0.140                                     | V                                          | \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \      |             |  |
| POSSIBLE SAMPLE HAZARDS/REMARKS  T(CTO BIHLK/K  Special Handling and/or Storage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Ú                                                           | Preservation            | Cool 4C                                     | Cool 4C                                                                                  | Coel 4C                                                                                                                           | Coel 4   | C Cool 4C                                   | Cool 4C                                   | Cool 4C                                   | None                                       | None                                       |             |  |
| The second of th | 1                                                           | Type of Container       | aG                                          | aG                                                                                       | P                                                                                                                                 | aG       | aG                                          | aG                                        | aG                                        | P                                          | aG/                                        |             |  |
| Special Handling and/or Storage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                             | No. of Container(s)     | 1                                           | 1                                                                                        | 1                                                                                                                                 | l        | 1                                           | 1                                         | 1                                         | 1 177                                      | 1/                                         |             |  |
| Wone                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             | Volume                  | 250mL                                       | 120ml                                                                                    | 1000mL                                                                                                                            | 250m     | L 250mL                                     | 250mL                                     | 120mL                                     | 1000mL                                     | 120mL                                      | P           |  |
| SAMPLE ANALYSIS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                             |                         | See item (1) in<br>Special<br>Instructions. | Cluomin<br>Hex - 71                                                                      |                                                                                                                                   | PCBs - 8 | See item (3) in<br>Special<br>Instructions. | See item (4) i<br>Special<br>Instructions | Range -                                   | See item (5) in<br>Special<br>Instructions | See iem (6) in<br>Special<br>Instructions. | tie<br>to   |  |
| Sample No. Matrix * S.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ample Date                                                  | Sample Time             |                                             |                                                                                          |                                                                                                                                   |          |                                             |                                           |                                           | /                                          |                                            |             |  |
| B14KC7 SOIL <i>5</i> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 17.0 :                                                      | 2 1109                  | ×                                           | <b>*</b>                                                                                 | *                                                                                                                                 | ኢ        |                                             | <u>x</u>                                  | _ ^ `                                     |                                            |                                            | BIYLKY      |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                             |                         |                                             |                                                                                          |                                                                                                                                   |          |                                             |                                           |                                           | 17/                                        |                                            |             |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                             |                         |                                             |                                                                                          |                                                                                                                                   |          | Pe<br>re                                    | ersonnel no<br>linquish sa                | ot available to<br>amples from toon 5 / 2 | he 3728                                    |                                            |             |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                             |                         |                                             |                                                                                          |                                                                                                                                   |          | Re                                          | ef# <u>2</u> A                            | on <u>5/2</u>                             | LOL                                        |                                            |             |  |
| CHAIN OF POSSESSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             | nt Names                |                                             |                                                                                          | PECIAL INSTR                                                                                                                      | UCTIC    | NS                                          |                                           |                                           |                                            |                                            | Matrix *    |  |
| R.f. hlberg 5-17-02  Refinguished By/Removed From Date/Time OF Dee  CP ZA 3+Z8 5-Z10-2  Refinguished By/Removed From Over Date/Time OF Re                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Elved Rysi                                                  | and S.17.00             | Pate/Time                                   | (1) ICP Matele 6010A (Supertrues) (Arganic Perium Codmium Chromium Lead Salanium Situati |                                                                                                                                   |          |                                             |                                           |                                           |                                            |                                            |             |  |
| Texes 5-22-02 1000 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             | encury 5-2              | Date/Time<br>スータン して<br>Date/Time           | 70 T                                                                                     | 1X Add-On) {1etrahydroluran} (4) Semi-VOA - 8270A (TCL); Semi-VOA 8270A (Add-On) {1,2,4-Trimethylbenzene, Cyclohexanone, T=Tissue |          |                                             |                                           |                                           |                                            |                                            |             |  |
| Neptunium-237, Nicket-03, Stromium-89,90 Total Sr, Technetium-99, Tritium - H3; Isotopic Uranium (6) Isotopic Plutonium, Americium-241 (Americium-241), Americium-244                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                             |                         |                                             |                                                                                          |                                                                                                                                   |          |                                             |                                           | X=Other                                   |                                            |                                            |             |  |
| Relinquished By/Removed From Date/Time Re                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ceived By/S                                                 | tored In                | Date/Time                                   | 1                                                                                        | (Add-on) (Curium 2                                                                                                                | 243}     |                                             |                                           |                                           | RTS                                        | 1.21.0                                     | 2           |  |
| LABORATORY Received By                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                             |                         |                                             |                                                                                          |                                                                                                                                   |          |                                             |                                           |                                           |                                            |                                            |             |  |
| SECTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | -                                                           |                         |                                             | Title .                                                                                  |                                                                                                                                   |          |                                             |                                           |                                           |                                            | Date/Time                                  |             |  |

## LIONVILLE LABORATORY INCORPORATED SAMPLE RECEIPT CHECKLIST

CLIENT: HANFORD

Purchase Order/Project:

DATE: 5-22.02

SAF# / SOW# / Release #: 302.050

Laboratory SDG #:

0205 6734

| NOTE: | ALL ENTRIES MARKED "NO" MUST BE                                                                                                                                                               |        |                  | ENT SECTION |                 |  |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------|-------------|-----------------|--|
| 1.    | Custody seals on coolers or shipping container intact, signed and dated?                                                                                                                      | D/Yes  | □ N <sub>0</sub> | □ N/A       | □ see Comment # |  |
| 2.    | Outside of coolers or shipping containers are free from damage?                                                                                                                               | Ų X es | □ No             | □ N/A       | ☐ see Comment # |  |
| 3.    | Airbill # recorded?                                                                                                                                                                           | D Yes  | □ No             | □ N/A       | □ see Comment # |  |
| 4.    | All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid) | DXes . | □ No             | □ N/A       | □ see Comment # |  |
| 5.    | Sample containers are intact?                                                                                                                                                                 | ₽Xes   | □ No             | □ N/A       | ☐ see Comment # |  |
| 6.    | Custody seals on sample containers intact, signed and dated?                                                                                                                                  | D.Yes  | □ No             | □ N/A       | □ see Comment # |  |
| 7.    | All samples on coc received?                                                                                                                                                                  | DX es  | □ No             | □ N/A       | □ see Comment # |  |
| 8.    | All sample label information matches coc?                                                                                                                                                     | ⊠-Yes  | □ No             | □ N/A       | □ see Comment # |  |
| 9.    | Laboratory QC samples designated on coc? (QC stickers placed on bottles?)                                                                                                                     | ₽¥es   | □ No             | □ N/A       | ☐ see Comment # |  |
| 10.   | Shipment meets LvLl Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)                                                                           | DYes   | □ No             | □ N/A       | ☐ see Comment # |  |
| 11.   | Where applicable, bar code labels are affixed to coc?                                                                                                                                         | □ Yes  | □ No             | DANIA       | □ see Comment # |  |
| 12.   | coc signed and dated?                                                                                                                                                                         | □ Yes  | □ No             | □ N/A       | ☐ see Comment # |  |
| 13.   | coc faxed or emailed to client?                                                                                                                                                               | Ŋ Yes  | □ No             | □ N/A       | ☐ see Comment # |  |
| 14.   | Project Manager/Client contacted concerning discrepancies? (name/date)                                                                                                                        | □ Yes  | □ No             | ⊠N/A        | □ see Comment # |  |

Cooler # / temp and Comments:

.02.0004 220

Laboratory Sample Custodian:

Laboratory Project Manager:

Will Neemand